

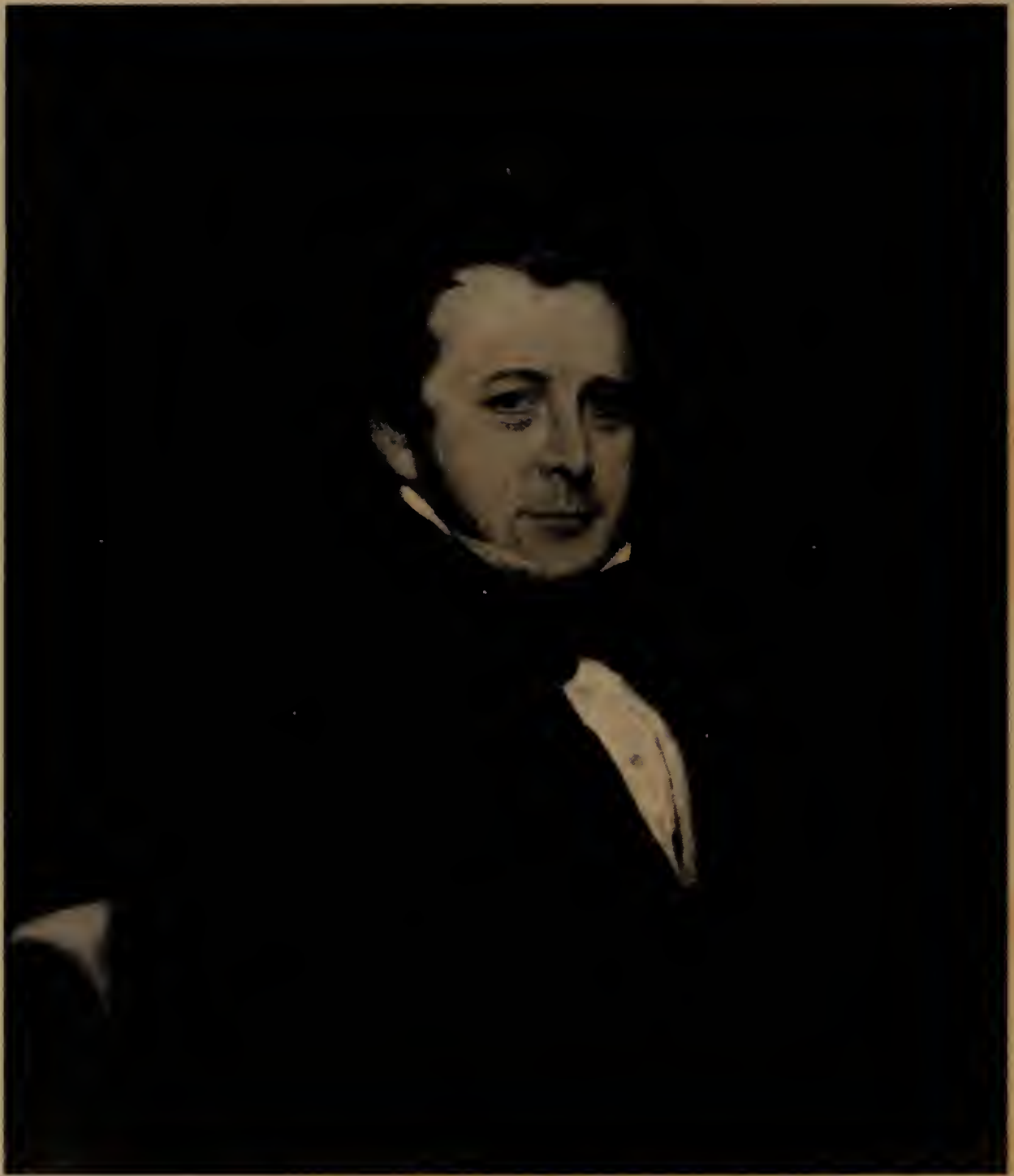
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Able men of Boston



FROM THE PAINTING BY CHESTER HARDING

COURTESY OF MRS. E. GERRY CHADWICK

JAMES READ

Founder of
the Boston Manufacturers Mutual

*“A testimonial of his Integrity as a Merchant
and his Honor as a Man”*



ABLE MEN OF BOSTON

*The remarkable story of the first 100 years of the Boston
Manufacturers Mutual Fire Insurance Company.*

*Its men, its times, and its growth—in insur-
ance protection, in fire prevention know-
how, in ever vital service and security
to North American industry.*

1850 – 1950

BY
DANE YORKE

Published by the
BOSTON MANUFACTURERS MUTUAL FIRE INSURANCE CO.
BOSTON, MASSACHUSETTS

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To write of fire insurance is, paradoxically, to write of a tangible that is yet quite intangible. In essence fire insurance is a promise—and rests upon honor, integrity, and ability. Like the air we breathe, fire insurance is known by its effect rather than by form or appearance. When needed, it is valued and appreciated. When loss does not strike, it is often forgotten, little considered, and its wonder ignored.

But if it is difficult to write of fire insurance itself, then how much more difficult to write of the work of the Boston Manufacturers Mutual Fire Insurance Company. For a full century its insurance promise has been faithfully and completely kept . . . but that is only one part of its remarkable service to North American industry. The greater role of the Company, and of its brother-companies in the Factory Mutual system, has been in the actual prevention of fire or the sharp cutting down of its destructiveness. Not by magic or luck or happenstance—though the results have been magical. Rather by foresight, by constant alertness; by know-how gained from long experience and pioneering research.

But how describe a fire that never happened? How measure a loss that never occurred—was never allowed to occur? Yet just such might-have-beens are exactly what the Boston Manufacturers Mutual has been achieving for a full century. Behind that record, from earliest days, have been able men. This is their story, and a glimpse of the times in which they worked.

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CHAPTER ONE

The Temple Club

MEN were arguing a century ago, as always—did the year '50 end a half-century or did it begin one? And the answer, then as now, depended less on logic than upon the color of the minds of those who argued. On one point, however, there was agreement—change, much change, was in the air of Boston. As Edward Everett Hale later wrote of this time:

“Whoever deals with the local history of the town in those years has to attempt the description of a certain local ferment, involving eager expectation and a readiness for new things, which certainly does not characterize the Boston of later times.”

The year 1848 had brought into Boston the first public water system, with water drawn from Long Pond (quickly renamed Lake Cochituate) some twenty miles away. The celebration of escape from wells and cisterns in Boston homes began at dawn on October 25th with the firing of 100 cannon on Boston Common; it reached its climax at sunset in the Frog Pond with the turning on of a fountain of Lake Cochituate water that rose 80 feet in the air and around which fireworks played all evening. No wonder Ralph Waldo Emerson wrote in his “Journal” the next year:

“In New York they characterize our hats and books and beauties as Frogpondish; but we on the other hand pity the whole un-Cochituated creation.”



City Water Celebration, Boston Common, 1848

Boston had reason for that mid-century pride. Its great sea trade had been built by men born before 1800. Those men had seen that sea trade fall away during the Embargo and the War of 1812. Undismayed, they had then swung money, energy and brains into a remarkable era of manufacturing advance that began with the textile mills at Waltham in 1814, followed by Lowell in 1822. Those men, many of them, were still vigorous in 1849 and still a force. But beside them was now a new generation born between 1800 and 1810 (the same decade that gave birth to Abraham Lincoln, Charles Darwin, Robert E. Lee). That new generation in Boston was also a building generation: to it can be credited the textile cities of Lawrence, Massachusetts, Manchester, New Hampshire; Biddeford and Lewiston in Maine. It was the generation that also built the railroad network of New England, the railroad development around Chicago, and was a force in the opening of the West.

The great literary flowering of Boston and New England was also part of the work of this same generation. Emerson, Hawthorne, Whittier, Longfellow and Oliver Wendell Holmes, were all born between 1800 and 1810 and were college mates of the men under whom Boston and New England had a business and industrial flowering. Characteristically it was Emerson whose clear eye gave fair recognition to his business and manufacturing compeers. Wrote Emerson: "Commerce is a game of skill which every man cannot play; which few can play well!" It was Emerson also who wrote of a Boston business man in these admiring words: "How little this man suspects, with his sympathy for men and his respect for lettered and scientific people, that he is not likely ever to meet with a man who is superior to himself." That statement, giving praise to a business man, has been conveniently ignored by later supercilious literary critics—but there was truth in Emerson's words. The men who built the best of New England's literature, the men who built the best of New England's industry, were cut from the same cloth. Or, to change the figure, they were obverse and reverse of the same sound Boston coin.

Much has been written of the famous Saturday Club, as part of Boston's literary flowering. But little is known, and less has been written, of another Boston club that played an equivalent role in the city's business and industrial flowering. That club antedated the Saturday Club by almost thirty years; its name was the Temple Club.

Early in the 1800s, a group of Boston business men had gotten into the habit of playing together at cards and billiards in rooms near State Street. About 1829 they casually formed a club; ten years later they perfected their organization and called themselves the Temple Club—because they had found better quarters on Temple Place near the home of a prominent

member, Colonel Thomas Handasyd Perkins. That remarkable Boston personality had seen, as a child of 5, the bodies of the victims of the Boston Massacre. At 25 he had sailed for China; at 30 he had witnessed in France the public execution of the infamous Robespierre—and at 62 (he lived to be 90!) had been the vigorous driving force behind Boston's first railroad building. No one with such a background can be dismissed as “merely a business man”, and a background of such variety and depth was far from uncommon in the Boston of 1850. It was Perkins and his fellow-merchants and industrialists, David Sears, Peter C. Brooks, Nathan Appleton, who with Cabots, Amorys, Dexters, Hoopers, Lymans, Sohiers, and others, made the Temple Club for many years after 1839 the club “most representative and best of Boston's male society”.

By 1848 the Club was outgrowing its rented quarters on Temple Place, and early in 1849 the president, James Read,



The Temple Club, West Street,
as seen from Mason Street

bought land for the Club on West Street (opposite Mason) and then headed a list of 25 members who subscribed \$45,500 as a building fund. The clubhouse, finished late in 1849, was immediately accepted as a Boston feature and thus described in the early guide-books:

“The new Club House, situated on the northerly side of West Street, is worthy of notice among the improvements of the city. It is 38 feet in front, 80 feet deep, and 52 feet high. The front elevation is built of Connecticut freestone in Italian style, and combines great architectural beauty.”

There were dining rooms, card rooms, reading rooms, a bowling alley, and a billiard hall that was two stories in height and “the noblest private room adapted for this particular purpose to be found in the city”. For another fifty years (until 1899) that building gave the Temple Club the distinction of being the only club in Boston whose home had been built especially for club purposes, and King’s *Handbook of Boston* pictured it in edition after edition as one of the city’s showplaces. When the Club died out around 1920, it was considered “the oldest purely social club in the United States”. In the words of a Boston writer, “it (the Temple Club) is still represented by one of its offshoots, the Somerset, which grew out of the Tremont, the latter being a child of the Temple”.

A point of unusual interest is revealed by the surviving by-laws of 1850. They show the Temple Club to have given its president very broad powers. James Read, then president, not only had “the whole control and management of the Club”, including the employment of “such superintendents and assistants as he may think proper”, but he had also full authority to “lay such assessments as may be necessary to keep the Club free from debt”. Such powers could be given only to men of high standing; in the Club’s first eighty-four years there were

only eighteen presidents. That James Read was one of the eighteen speaks well for the regard in which he was held. And it is significant of his standing and leadership that it was during his presidency (and just as the new clubhouse was completed) that he began to organize the Boston Manufacturers Mutual Fire Insurance Company. Half of the group he drew together for that purpose, came from the Temple Club. Four of the seven men on the first Board of Directors were Temple Club members.



COURTESY OF THE BOSTONIAN SOCIETY

West Street, in the 1850s, looking from
Tremont Street. The Temple Club is
the third building on the left

CHAPTER TWO

A Man's Plain Record

JAMES READ is an interesting figure of old Boston. He was president of the Temple Club, but neither family nor school tie brought him that honor. Though born within sight of the halls of John Harvard he was uncolleged, and came up the hard way—by innate ability, proven integrity, solid worth. But the experience did not mark him with the humorless pomposity so often found in selfmade men. James Read's portrait shows a calm man, a friendly man, a man to inspire confidence and trust—whose eye held a warmly genial twinkle. His record proves that portrait true.

He was born in Cambridge in 1789, the year George Washington became the first president of the United States. His father was a saddler and also, for many years, the Cambridge postmaster. But neither saddlery nor the postal fees of what was then a village gave overmuch money on which to raise a family of ten children. At 14 or 15 the boy James was apprenticed to a Boston merchant, "walking from Cambridge every Monday morning with his bundle of clean linen over his shoulder, and walking back to Cambridge every Saturday evening with his bundle of soiled linen." His working hours were from sunrise to dark each day; his pay less than one dollar a week . . . as was then the rule. Somehow he saved a little here, a little there, and managed to have two dollars available to invest in one-eighth of a ticket when Harvard College held a lottery to raise the funds to build Holworthy Hall. That ticket won first prize of \$16,000, and young Read's

share of \$2,000 would have turned the head of many another boy. Read was then not quite seventeen, which is seldom a thoughtful age. But the first use he made of his winnings . . . was to pay off the debts his father had incurred in the raising of that family of ten children. Thus early, James Read showed his fibre.

When his apprenticeship ended, at 21, James Read received the usual reward of a small sum of money (sometimes \$50, but never more than \$100) and "a good suit of clothes." With that money, and possibly some remainder of his lottery winnings, he set himself up as a small commission merchant in Scollay Square. At 26 he married, and soon had so prospered that he could invest in a small cotton mill at Dedham. Some years later he was so directly responsible for saving that mill from failure that the people of the community around the mill voted, in gratitude, to name their section for him. The name Readville still appears on the maps of Boston as part of what is now Hyde Park.

All this might easily be the record of a mere moneymaker. That Read was more is strikingly shown by a friendship that began in this pre-1837 period. West Roxbury was then noted for fine homes, occupied by Boston merchants, and there Read lived in summer for fifteen years—commuting each weekday, by horse and carriage, to and from his Boston store. There in the early 1830s Read first entertained Lorenzo Papanti, that revealing figure of old Boston.

Papanti was then a newly arrived political refugee from Italy. Scion of an aristocratic Italian family, an officer in the army of the Duke of Parma, he had had to flee for his life to an Italian port where the officers of an American warship (said to have been the famous *Old Ironsides*) had sympathetically concealed him as a member of the ship's band. Arriving in Boston with his young wife, he courageously eked out a



COURTESY OF THE BOSTONIAN SOCIETY

The Tontine Crescent, Franklin Street,
built by Charles Bulfinch in 1794

scant livelihood by playing his violin in a theater orchestra and by giving dancing lessons in Boston homes. Oddly enough, Edward Atkinson, then a boy of nine, who was later to serve his own early apprenticeship under James Read, set down near the close of his long life his own vivid memories of the man. After recalling that he had attended dancing school at the later famous Papanti's Hall on Tremont Street, Atkinson wrote:

"Some of his earliest lessons in dancing (were given) at my father's home in Brookline when I was a small child, and I well remember his wife who played the guitar with his violin. She brought me sugarplums. . . . He was a true gentleman in the highest sense."

The modern deep prejudice against the dancing master could not then have been common—or perhaps the man counted more than his occupation. By 1850, and for a full generation thereafter, Papanti's Hall (torn down in 1904) was a civilizing force in Boston through which the youth of the city had firsthand contact with Old World courtesy and Old World grace as embodied in the tall, dignified figure of Lorenzo Papanti. So many famous balls and banquets were held in the Hall that it became a token of the best in social entertainment.

A man is known by the company he chooses. James Read's friendship with Papanti tells something of his all-round character—over and above any business success. That friendship began when one man was an almost penniless refugee; it continued through life—in mutual interests, liking, and deep enjoyment. And always there was music when the Papantis came to call—he with his violin, his wife with her guitar. Many years later Read's grandson set down this pleasant picture of those evenings, now more than a century ago:

“It is recalled in the family that when Mrs. Papanti sang Italian songs after supper in West Roxbury, my grandmother would close every window and shutter, lest some passer-by should overhear songs which at that day were thought to be shocking.”

But if the closed windows and shutters ever made the Papantis wonder, the twinkle in the eye of James Read soon reassured them. And the singing was never interrupted, nor the songs and visits stopped. There was more good life in old Boston than the history books have ever revealed.

The idyllic days at West Roxbury ended in 1837 when the great commercial crisis of that year caused Read to give up his summer home. His Boston winter residence then became his year-round dwelling; it was located on Franklin Place,

part of the famous Tontine Crescent built by Charles Bulfinch in 1794. The Tontine Crescent is noted in architectural history as the first unified brick dwelling-block built in America; its site is still marked by the curving south side of Franklin Street from Hawley to Devonshire. For many years it was a landmark, and one of the best residential sections of Boston.

The Tontine Crescent was still his home when in March, 1842, the firm of James Read & Company suddenly failed. It was a failure so unexpected that it stunned business Boston . . . and what followed stirred the merchants even more. Just a month before that failure the famous Bankruptcy Act of 1842 had gone into effect. It was a law so poorly conceived that before it was hastily repealed by Congress a year or so later, "more than twenty-eight thousand (debtors) had been relieved of nearly four hundred and forty-one millions of dollars of debt by the surrender of less than forty-one million dollars of property"—an average return of about ten cents on the dollar. But what stirred Boston was that James Read characteristically refused to take advantage of the law's loopholes. Instead, he turned over for the benefit of his creditors every bit of property that he had. From its sale his creditors finally received better than 86 per cent of their claims.

James Read did not stop there. He had begun again in the commission business; his ability was such that within about two years he had accumulated more than \$50,000—a sum which he found would pay off the remaining 14 per cent of his bankruptcy debts. He talked it over with his wife and daughters and then once more (at 55 years of age) voluntarily stripped himself of every negotiable asset to make that final payment. The effect of that action on business Boston is best told in a statement drawn up by his creditors:

"The house of James Read & Co., were forced by the disasters of the times to suspend payment in the month of

March, 1842, with an indebtedness of \$850,000, of which sum \$500,000 was secured by pledges of stock and other property, and paid in full, leaving \$350,000 to be provided for from the assets in the hands of the assignee. From these assets . . . aided by the advice and judgment of Mr. Read, the general creditors received dividends amounting to eighty-six per cent upon their respective claims, and have since, by the voluntary act of Mr. Read, who had previously been legally and honorably discharged, received from him the additional fourteen per cent to make up to each creditor the full amount of his claim. In token to Mr. Read that the creditors of his late house appreciate his highly honorable conduct in thus appropriating to this object a sum amounting to more than \$50,000, accumulated since his failure, from the fruits of his own well directed industry, it is now by this meeting unanimously

RESOLVED: That it is due to Mr. Read, as well as to ourselves and the whole Mercantile Community, that public notice should be taken of this act of high integrity and personal honor. And that the thanks of this meeting, as well as some testimonial of respect and approbation, be tendered to Mr. Read by his creditors."

On New Year's Day, 1846, the "testimonial" was delivered to the home of James Read. It consisted of a large "service of silver" with the following inscription:

TO
JAMES READ
A TESTIMONIAL OF HIS
INTEGRITY AS A MERCHANT
AND HIS HONOR AS A MAN

As a lad of sixteen, James Read had unhesitatingly spent his lottery winnings to pay his father's debts. Forty years later, as a grown man, he had in two years twice stripped himself of

all his earnings so that no one who had trusted the name of Read should lose through that trust. It is seldom that the founder of an American institution has left behind so plain a record of his quality.



THE EARNED TRIBUTE
An epergne, and inscription, from the
silver service presented to
James Read in 1846

CHAPTER THREE

Beginnings and Backgrounds

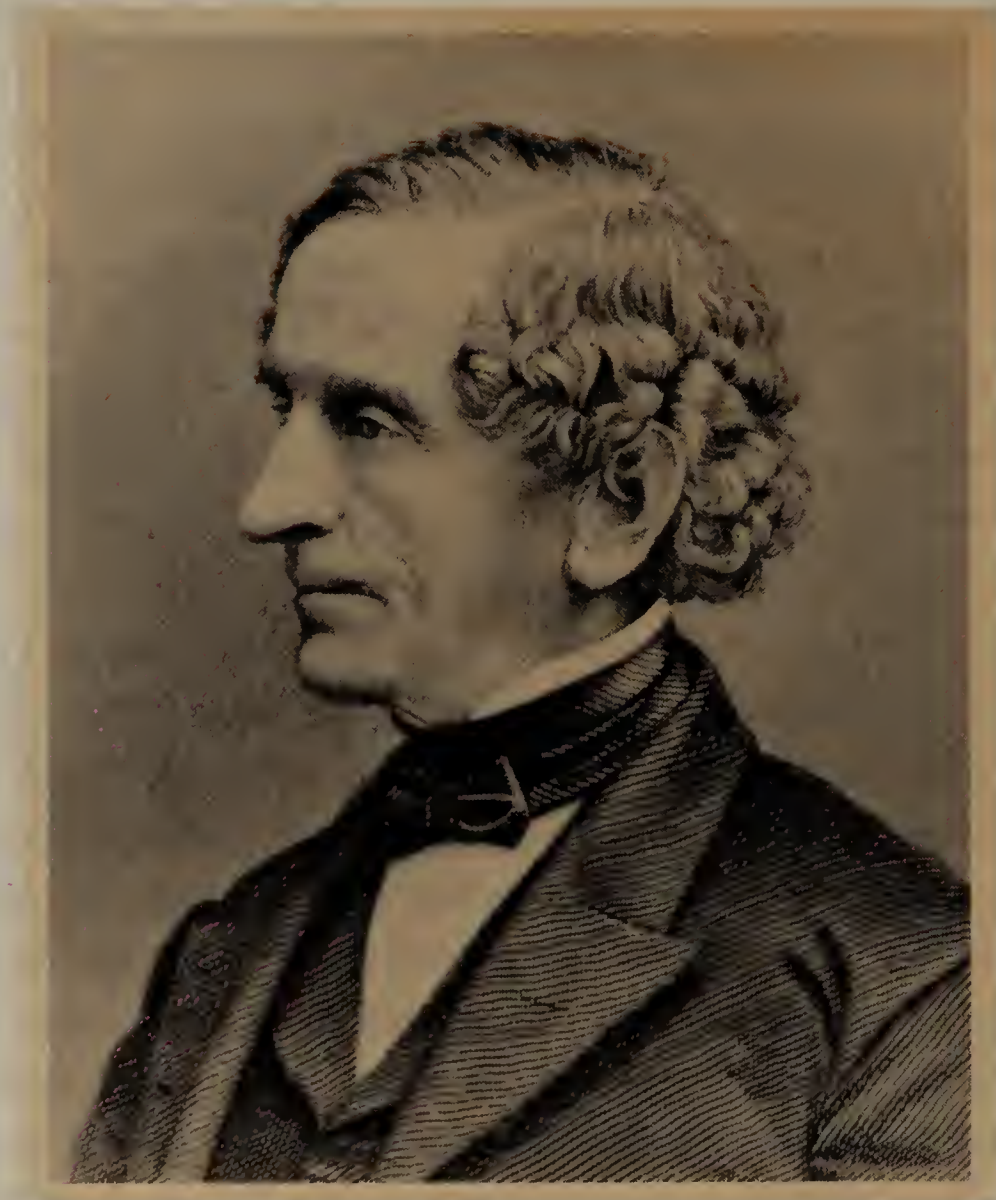
JUST when James Read became interested in factory mutual fire insurance is not known. But the conditions that turned his mind to the subject are clear in history. In 1846 a tariff law was passed by Congress which sharply changed national policy. The principle of protection under which the textile industry had grown for thirty years was abandoned. The political panacea "tariff for revenue only" was launched for the first time; the novelty of "ad valorem" tariff rates was introduced. This led to a marked increase in competition from imported goods, and mill earnings were soon falling. Dividends which in 1846 ran from 12 to 20 per cent, dropped to 2 and 3 per cent in 1848. Nor was 1849 any better. Foreign calicoes, gingham and cottons "crowded" the Boston market at prices that the high cost of Southern cotton made it hard for New England mills to meet. Layoffs and shutdowns grew; part of the incentive to join the great California Gold Rush that year was the hope of escaping "hard times" at home.

With such a background an increase in fire loss was almost inevitable. Such increase, in turn, then stiffened insurance rates and made the fire underwriter cut down his lines on the risks that most needed insurance protection. But that same background also put heavy pressure upon ownership and management to keep up insurance, and at the same time reduce operating and overhead costs—of which the insurance premium was one. In 1849 James Read was part owner or selling agent for five Massachusetts cotton mills and thus keenly

aware of the economic pressure of the times. He also had business connections of long standing with the textile industry in Rhode Island; particularly he was friendly with John L. Hughes of Providence who in 1848 had become secretary of a new mutual fire insurance company that had begun business in September of that year. He had known Hughes as a small cotton manufacturer; he was interested in Hughes' new occupation. Through Hughes there came to Read in the autumn of 1849 the historic letter from Zachariah Allen quoted in full in the Appendix.

Born in Providence in 1795, Allen was six years younger than James Read. His way in life had also been easier. He was the son of a wealthy shipowner and manufacturer of Providence, whose early death put a large estate behind Zachariah Allen and gave him the means to indulge his instinctive scientific and inventive bent. He is credited with being the first man "to calculate the power of Niagara Falls". In 1821 he is said to have "constructed the first furnace for domestic heating"; in 1822 he secured for Providence an improved hand fire-engine and in 1825 he went abroad to study the textile mills of England and Europe. The report he published on his return made him an authority on world textiles.

Allen's interest in foreign textile operations had grown out of the fact that three years before (in 1822) he had built his own small woolen mill—a stone structure 60 feet long, 40 feet wide, four stories high; with some 600 spindles and employing about 60 hands. With his means, he was able to equip that mill with unusual completeness. But the question of insurance and rates was, oddly, never raised by him in the thirteen years between 1822 and 1835. And the inference is unmistakable that it was the economic pressure of 1835 that turned his mind to the subject, just as the pressure of 1848 and 1849



ZACHARIAH ALLEN
Founder of Factory Mutual Insurance, 1835

was to turn James Read's. For that matter the business conditions were much the same in the two periods. Those of 1849 have already been sketched; as to 1835 the trouble also arose from government action—the battle of Andrew Jackson with the Bank of the United States, and his famous removal of government deposits from the Bank late in 1833. The resultant situation has been thus summarized by the historian, John Bach McMaster:

“Along the seaboard, the hard times which followed the removal of the deposits and the depressed state of business caused by State banks refusing loans, was followed by . . . money at two and a half per cent per month, with products of all kinds selling at greatly reduced prices or not selling at all; with mills and factories shutting down or discharging hands by the hundreds.”

There were heavy fire losses; the fire insurance companies of the day (the “cash offices”, as they were called because all fire insurance policies were then delivered only for cash) of course advanced their rates—including the rate on Allen’s own mill, as is shown by the direct statement in the second sentence of his letter to Read. Stung by the rate advance, angered by the refusal of the “cash offices” to admit that one mill might be a better risk than another, Allen called together a group of Providence friends and associates to form the Manufacturers Mutual Fire Insurance Company of Providence in November, 1835.

Mutual fire insurance was not new in 1835—its history in this country goes back to the preceding century in associations of farmers, merchants, and householders. Neither was Allen’s emphasis on fire preventive care and equipment new—the first mills at Lowell in 1823 were equipped with force-pumps which supplied cisterns on the roofs “and a hydrant in each story,” and as early as 1828 the Lowell mills were laying water mains in the mill yards to supply hydrants at regular intervals close to the mills. To go back still further, the first mutual fire insurance company in Massachusetts (The Massachusetts Mutual Company) was organized and chartered in Boston in 1798 and its method of operation has been thus described:

“One of their first efforts was to teach their policy-holders the necessity of protecting themselves. They offered rewards of money, not exceeding ten dollars, for good serv-

ices performed by citizens at fires. If any of the holders of policies allowed their pumps to get out of order, and permitted them to remain so after a notification from the office, they were fined \$2, and \$2 additional for every week that they continued out of repair; while those who allowed their chimneys to get on fire were fined one dollar.”

That early Massachusetts Mutual Company had also four different rates of insurance, whereby it set off and rewarded the risks of best construction and least exposure.

Thus the real novelty of Zachariah Allen’s approach to mutual fire insurance was that he planned his company for manufacturers only—which explains the importance of the word “manufacturers” in the title of his first company, and in that of the Boston Manufacturers Mutual formed by James Read. That the word also at first meant textile mills primarily, was simply due to the fact that until well after the Civil War the predominant form of manufacturing in New England was textile manufacturing—and when the words “manufacturers” or “manufacturing” were used, it was textiles (usually cotton textiles) that was meant and understood.*

That first mutual fire insurance company of manufacturers had had a favorable first year, being able to make a dividend return of 51 per cent on the original premiums. And fourteen years later, when Zachariah Allen wrote to James Read (in September, 1849) he was able to quote “an average saving of 53 per cent of the premiums charged by the cash offices”,—a good showing.

That record satisfied James Read. He went on with his plans for organizing the Boston company.

* Incidentally, the first cotton mills were known as “manufactories” which usage soon shortened simply to “factories”. Similarly the manufacturers mutuals were later called factory mutuals.

CHAPTER FOUR

Headlines — and Solid Builders

THE Massachusetts General Court convened in January, 1850, and on February 7th a charter-petition was filed by the men whom Read had interested in the project. It was a time of headlines; of turbulent public emotion. The South was on the rampage in Washington: the struggle over slavery's extension was again acute, and seven Southern states were threatening to secede—in strange anticipation of the actual secession of ten years later. The aged Henry Clay had just introduced into Congress the measures of the bitterly debated Compromise of 1850 that included such diverse proposals as the Fugitive Slave Law and the admission of California as a state. When on March 7th, Daniel Webster arose in the Senate at Washington and came to the support of Clay with his famous plea still known (from the date of its delivery) as the Seventh of March Speech, his lawyer-argument that the South had a right to pursue and reclaim its black fugitives stirred and shocked Boston and New England more than any other address that Webster ever made. By an odd coincidence, in this same month another Webster was also in the headlines—Professor John Webster, whose trial then began for the murder of his Harvard colleague, Professor Parkman.

But the thoughtful historian, looking over the newspaper headlines and editorials of another day, is constantly reminded that screaming type and bitter argument can never reflect more than a part of the actual current of the times. The headlines may be important (they were in 1850) but behind them

or aside from them is a quieter level where solid builders are laying foundations for work that will endure long after the newspaper files are buried in library vaults. To found a company destined to grow steadily through a century and more; a company that was to draw to itself men who would achieve for it an unique and vital place in the great development that was to make American industry the wonder (and envy) of a world . . . such a founding would seem to have merited headlines. But it did not in 1850 and, sadly, it would not today. Instead, unnoticed by the headline writers, the charter-act passed the lower house of the General Court on March 14th—just a week after Daniel Webster’s speech, and while the furious debate over it was still mounting. On the next day the upper house gave its approval and the act was immediately signed by the Governor. Thus on March 15, 1850, to quote in part the wording of the legislative document:

“John Clark, William Dwight, Pliny Cutler, their associates and successors, are hereby made a corporation by the name of the BOSTON MANUFACTURERS MUTUAL FIRE INSURANCE COMPANY in the City of Boston . . . for the purpose of insuring manufactories, and other buildings, and their contents against loss or damage by fire . . .”

Exactly one month later, on Monday, April 15th, the charter associates met in the City Bank Building at 61 State Street in the office of William Dwight. Their legal adviser was Francis E. Parker, son of a New Hampshire minister, honor graduate of Harvard, and law-partner of Richard Henry Dana, Jr., still famous as the author of the sea-classic, “Two Years Before the Mast”. Parker, in 1850, was only 30 but already noted as a sound business lawyer. Under his guidance the organization meeting moved smoothly, the charter was accepted and by-laws ordered prepared. On Saturday morning of that same

week the associates met again in Dwight's office; this time they approved the by-laws drawn up by Parker, and elected the first Board of Directors.

Of the twelve men whose names appear in the old records as charter associates, or as members of that first Board, just one-half were members of the Temple Club. Also six of the twelve had been born before 1800, and the remainder between 1800 and 1814—again that curious mingling of the generations so characteristic of Boston solidity. The oldest was James Read, at 61; the youngest was Amos A. Lawrence, 36, who in a few years more was to be a leading Boston supporter of John Brown of Osawatimie in the struggle for "bleeding Kansas." The city of Lawrence, Kansas, and Lawrence College at Appleton, Wisconsin, still preserve the memory of Amos A. Lawrence for whom both were named.

The next youngest member was Charles S. Storrow whose father had been a close personal friend of Washington Irving. Storrow, born in 1809 (the same year as Abraham Lincoln) was a classmate at Harvard of Dr. Oliver Wendell Holmes. After Harvard he went abroad to study (there were then no American schools of engineering) at the famous L'Ecole Polytechnique in France. He later went to England to observe the early English railways and returned to this country at the age of 33 to help build the first steam passenger railroad in New England. His ability drew the attention of Patrick Tracy Jackson and Abbott Lawrence who in 1845 put him in full charge of the development of the industrial city of Lawrence, Massachusetts. It was this work that led Oliver Wendell Holmes to afterwards refer to Storrow as "the thoroughbred and accomplished engineer who held the city of Lawrence in his brain before it spread itself out along the banks of the Merrimac". To Storrow's descendants, incidentally, is due the development

of the Charles River Basin in Boston, including the Storrow Memorial Embankment.

The twelve men were oddly diverse in origin and background. Seven were graduates of Harvard, one a graduate of Dartmouth; four were uncolleged. The uncolleged were all of the pre-1800 generation, and had all started “without a dollar” as the old saying went. James Read’s career has already been outlined. Pliny Cutler had started as a grocer’s clerk, achieved his own wholesale business, then turned to banking and industry and in 1850 was president of the Atlantic Bank of Boston, and treasurer of the York Manufacturing Company (now a division of the Bates Manufacturing Company) in Maine. Another associate, Isaac Livermore, had begun as an errand boy, developed into a wool merchant, turned to manufacturing and, in 1850, was treasurer of the Manchester Print Works that operated 50,000 spindles at Manchester, New Hampshire. A little later he swung to railroads and was active in the development of the Michigan Central Railroad, serving as its treasurer.

Also of the older generation was John Clark. Born at Waltham in 1796, he graduated from Harvard at 20, taught school in Salem to support himself in the study of law, and next was in legal practice until he was 37. He then drew the attention of Kirk Boott, that picturesque Boston-born figure who was educated at the famous Rugby school in England, fought under the Duke of Wellington in Spain, and returned to this country to become the virtual architect and builder of the textile city of Lowell. Boott, in 1833, persuaded John Clark to leave the law and become superintendent of the Merrimack Mills at Lowell. Four years later Boott died, but Clark stayed on in Lowell until 1847. In that year, at the age of 51, he came to Boston to succeed another great textile builder—Patrick Tracy Jackson—as treasurer of the Great Falls Manufacturing Company which by 1850 was operating more than 64,000 spindles

at Somersworth, New Hampshire. In this same year of 1850, John Clark was also to become the first president of the Pepperell Manufacturing Company whose mills at Biddeford, Maine, were then being financed and completed by William Dwight. Clark's sudden death in January, 1851, was to close an unusual career.

The linking of Pliny Cutler, John Clark and William Dwight, in the charter-act of the Boston Manufacturers Mutual undoubtedly came about through their close connection in the textile development at the Falls of the Saco River in Maine. None of the three was a member of the Temple Club, and Clark and Dwight were both newcomers to Boston's State Street. Their inclusion in the organizing group of the Boston Manufacturers Mutual reveals not only the wide range of James Read's business contacts but also his quick recognition of fresh ability, and his very practical wisdom in making that organizing group so strong in variety of interest, experience and background.

William Dwight is a particular case in point. Born in Springfield in 1805, he thus belonged to the same decade that witnessed the birth of Ralph Waldo Emerson, Nathaniel Hawthorne, William Lloyd Garrison, and the poets Whittier and Longfellow. A graduate of Harvard at 20, he had been admitted to the Massachusetts bar at 24 and practiced law in Springfield. Elected to the Massachusetts General Court he had served three terms, the latest in 1848, and Edward Atkinson was later to record how as a young man he had been "fond of attending the debates in the State House" in Boston where

"William Dwight was the orator whom I admired most. The act for the abolition of imprisonment for debt was one of the great causes of which Mr. Dwight was the chief promoter."

But in 1850 Dwight's law and legislative career lay behind

him. His brother-in-law, Jonathan Chapman, an early Mayor of Boston, had been active in the founding of the Laconia Mills at Biddeford, Maine, forerunner of the Pepperell Manufacturing Company of today. Chapman's sudden and untimely death in 1848 had brought Dwight to Boston: in succeeding Chapman as treasurer of the Biddeford development, Dwight had taken over his office at 61 State Street. When the associates of the Boston Manufacturers Mutual assembled in Dwight's office in April, 1850, he had already proved his ability in the operation of 39,000 spindles in the mills at Biddeford and was vigorously pushing forward the financing and building of more mills that soon would put 80,000 spindles under his management.

Thus appears the common factor in the diversity of that group of associates and directors, gathered by James Read to found the Boston Manufacturers Mutual. They were builders—solid builders, and able. Later critics of Boston seem never to have realized that at this period Boston was no longer a town, but a rapidly growing city displaying the one marked trait that so clearly sets off city from town—the quick acceptance of able new men regardless of family, school, or origin. Those same critics also have been fond of quoting Thomas Gold Appleton's derisive witticism of “cold roast Boston”. But again they have forgotten that Thomas Gold Appleton was himself the son of a great textile builder, and against that casual witticism should be set Appleton's earlier and sincere confession (made in 1845) that he felt “humbled and despicable before men who could build towns, pour whole villages into factories, and undermine the everlasting hills”. The men who founded the Boston Manufacturers Mutual a century ago, fitted that description in its best sense.

CHAPTER FIVE

First Steps

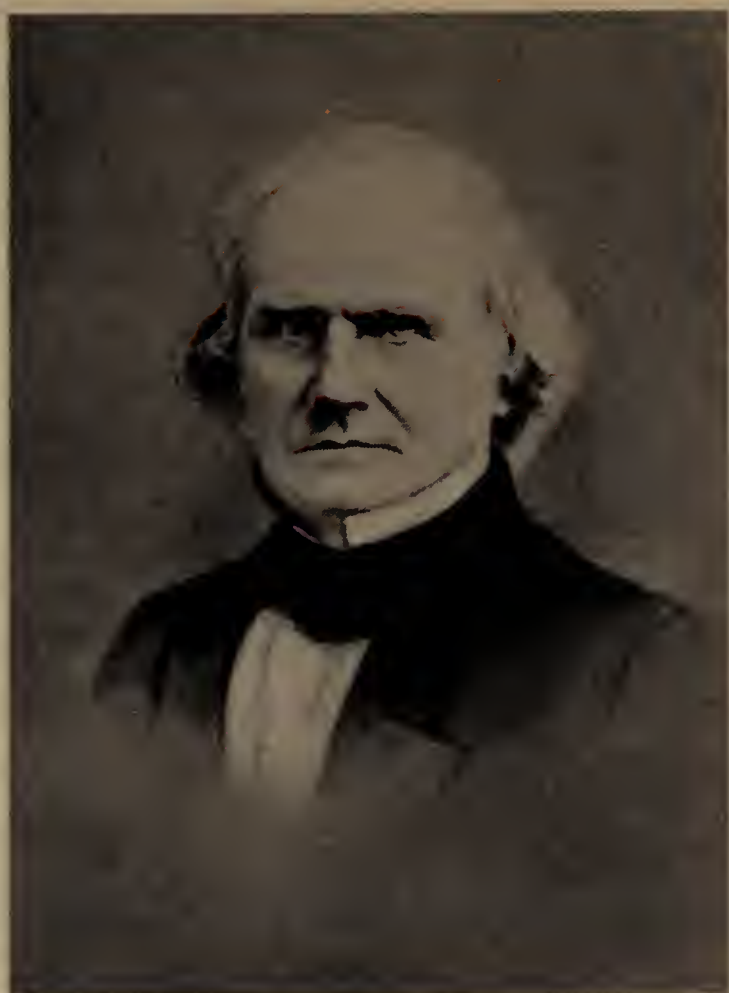
THE force and ability of that founding group was made clear from the start. For one thing the Massachusetts laws then applying to mutual fire insurance companies required that only \$100,000 of insurance must be subscribed before a new company could begin operations. But the men behind the Boston Manufacturers Mutual were not promoters, interested merely in meeting the legal requirements. This was to be their own company, built through their own active participation, and their firm standards of good faith made it necessary that their own stake in the company's success or failure be high. Accordingly the by-laws drawn by Francis E. Parker at their direction placed the initial subscription of insurance at one million dollars—ten times the amount demanded by law. And it is further significant that when that initial subscription of one million was made, a total of \$995,000 applied directly to the mills owned and managed by the twelve associates and directors. If there was risk in the project, those men made it plain that they were taking their full share. It was an action very characteristic of the Boston of that day.

They also stamped themselves boldly in another way. The first factory mutual fire insurance company in Providence had begun by limiting to \$20,000 the amount of insurance subject to one loss. By 1850 that limit had been reduced to only \$15,000 and it will be noted that Zachariah Allen in his letter to James Read in 1849, rather suggested the smaller amount as the limit of risk for any new company. But Boston had a mind of its

own, as always, and the by-laws of the Boston Manufacturers Mutual calmly set the limit at \$40,000—more than two and a half times the figure advanced by Allen. That action, however, was not dictated by any scorn of outside advice; it was simply that the Boston group knew better the field in which they were to work—a field marked by larger mills and a much larger operating scale of values than was common in Rhode Island.

The point is borne out by the next important action. The members of the Boston founding group were able men; they did not try to operate the new company on an amateur basis. Had they been less able, less open-minded, they might have turned to Boston itself for the practical fire insurance underwriter they needed. Boston, in 1850, had more than a dozen joint-stock fire insurance companies. James Read was a director in two, and four of the other associates were on the boards of Boston companies. Had they been prejudiced, or had they been inclined to experiment, there was plenty of insurance material in Boston to pick from. But it was John L. Hughes, of Providence, to whom James Read had first gone to ask about factory mutual operation. And Read's wise suggestion to the directors, that Hughes be brought to Boston, was promptly approved—Read and William Dwight being made a committee to interview Hughes. Two weeks later, at half-past nine o'clock of a Saturday morning—a day and hour amusingly variant from modern practice—the directors met again, approved the committee's report, and elected John L. Hughes as the underwriting executive of the Company with the title of secretary and treasurer. At the same time the directors completed the Company's organization by electing one of their number, John Aiken, as president. The date was May 4, 1850.

John Aiken, the first president of the Boston Manufacturers Mutual, had been born in Bedford, New Hampshire, in 1797. He had graduated from Dartmouth College in 1819, a class-



JOHN AIKEN

President, 1850

Director, 1850-1864

mate of Rufus Choate who in legal standing was to rank in New England with Daniel Webster. Aiken, after graduating, taught school for three years and then turned to the law himself. He practiced in Vermont until he was 36 and then made one of the characteristic transitions of the day—from the law to manufacturing—when he moved to Lowell (in the same year as John Clark) and became Agent of the Tremont Mills and later of the Lawrence Mills. In 1849 he became known as the Honorable John Aiken, through service as a member of the Executive Council of Massachusetts, and in that same year he published a textile study called “Labor and Wages at Home and Abroad” which was widely quoted in New England busi-

ness circles. In 1849 he also left Lowell and came to Boston as treasurer of the Cocheco Mills at Dover, N. H., and responsible for more than 60,000 spindles. Thus, though a newcomer to State Street, John Aiken at the time of his election as president of the Boston Manufacturers Mutual was a prominent and distinguished figure in New England textiles. He was 53 years of age.

When, late in May, John L. Hughes came to the office of William Dwight to be formally sworn in to his new post, the directors who met him for the first time saw a slenderly built man of fine features and quiet bearing. He may have been of the Quaker faith, though the fact cannot be definitely established now. At any rate he was sworn in by the so-called Quaker oath which in the old records is thus quaintly set down:

“Said Hughes declaring that he had conscientious scruples against taking any oath, solemnly and sincerely affirmed under the pains and penalties of perjury that he would faithfully discharge the duties of Secretary and Treasurer.”

Born in 1796, Hughes was thus older than any of the directors except James Read. His origins are now buried in time. He first appears in the Providence records in 1822 when, at the age of 26, he married the daughter of a Revolutionary veteran of Providence. In the middle 1830s he appears in the Providence directories as a “cotton manufacturer”, and probably operated one of the small mills of a thousand spindles and less for which the waterpower of Rhode Island was best adapted. He was of sufficient prominence to serve as a member of the Providence Common Council, and in 1835 was one of the organizing group with whom Zachariah Allen founded the first factory mutual fire insurance company. As a member of the original board of directors, Hughes served for seven years and then (in 1842) resigned from that company—probably

through the loss of his textile mill in the same financial crisis that caused the bankruptcy of James Read in Boston. The next six years are again a blank but in 1848 Hughes returned to the factory mutual field, being then appointed secretary of the second Providence company which Zachariah Allen organized that year. It is possible that Hughes owed that position in part to his friendship with John H. Ormsbee, an old-time insurance agent of Providence who along with his private insurance business acted also as secretary and underwriter (from 1835 to 1851) of the original Allen company. Hughes and Ormsbee had been fellow-members of the Providence City Council, and both the first and second factory mutual companies were side by side with Ormsbee's insurance agency in the same building. Thus when John L. Hughes came to Boston, he came as the first fire insurance underwriter trained and developed in the factory mutual system itself.

The spring and early summer of 1850 were gloomy in New England. A typical newspaper comment on mill closings and lay-offs, went on to say:

"At no period before have the prospects for (cotton) manufacturing been more gloomy, and never such uncertainty as to the duration of the depression."

It took some time for Hughes to free himself from his Providence obligations but when, on August 1st, he reported finally in Boston he found the directors of the Boston Manufacturers Mutual quite undeterred by the seemingly dark business future. They were textile men, trained in an industry that notoriously had been on a "feast or famine" basis since its beginning—an industry in which no man lasted long who frightened easily at the ups and downs of business. The economic pressure of the times only stiffened the determination of those men of Boston, and Hughes was given encouragement—not pause—in getting things started.

His first task was to find an office for the Company, which he did in the Shoe and Leather Dealers' Bank at 65 State Street—at the corner of Kilby. There the directors met on Wednesday morning, August 7th; authorized Hughes to employ a clerk, and then as the old minute book records:

“The gentlemen present severally agreed to make application for insurance for themselves and to solicit an amount from others in the sum required.”

The following Monday morning there was another meeting at which Hughes was assured that the necessary million dollars of insurance was available “and could be depended upon at any time.” With that firm backing Hughes went ahead. Application forms and policies were printed; massive policy books were prepared—books in which all details of policies issued were to be painstakingly copied by hand, as was then the custom. Next, applications were filled out—again by hand—for each property to be insured, and on September 2nd the directors met and approved the completed applications submitted by Hughes. It was no perfunctory gesture, that approval. Among the directors there was pooled knowledge—either personal or very direct—of the history, financial condition, equipment, and management calibre, of practically every cotton mill in New England—so centered was the industry in Boston. That knowledge was an asset, important in the new company's success.

Signed by John Aiken, as president, and John L. Hughes, as secretary, the first policies were then issued to cover the initial million of insurance. There were 48 policies, all bearing the same date of September 14, 1850. They ranged in amount from \$3,000 to \$40,000, and the total amount insured was \$1,111,275—of which almost 90 per cent is known to have covered mills which the directors and charter-associates owned, or for which they were responsible. Thus the launching of the Boston Manu-

facturers Mutual was no mere promotion venture. Rather it was a genuine mutual enterprise, an actual joining together by men of integrity who made their good faith plain by assuming a full share of whatever risk there might be. To quote again the words of the old minute book, the Company and the men behind it “could be depended upon at any time”.

So began, on September 14, 1850, the active operations of a Company whose record of constant dependability now enters upon its second century. But again there were no headlines in Boston to announce the event. Congress that month completed the passage of the Compromise measures that included the admission of California as the thirty-first State, and the enactment of the drastic Fugitive Slave Act which by October resulted in angry handbills on Boston streets and buildings—posted by an active “Vigilante Committee” to warn ex-slaves of the arrival of possible pursuers from the South. The *Boston Traveller* reported another effect:

“There seems to be considerable panic among the fugitive slaves who have been, some of them for years, quiet residents of this city. . . . Quite a number of families . . . where either the father or mother are fugitives, have been broken up, and the furniture sold off, with a view of leaving for safe quarters in Nova Scotia or Canada.”

And to give variety, Boston just then was under subtle attack by Phineas T. Barnum. For the autumn of 1850 saw that shrewd Yankee introduce the singer, Jenny Lind, to America in a burst of whipped-up excitement that became known as “Lindiana” and the “Jenny Lind fever.” The Boston newspapers reported her astounding reception in New York which included an auction sale of tickets for her first concert. The fame of Genin, the hatter, who carried off the first ticket

with a bid of \$225, was duly echoed (and marvelled over) by the Boston press. So that when on Wednesday morning, September 25th, Barnum staged in Tremont Temple his auction of tickets for the first Boston concert, the crowd was so great that for safety the front doors had to be pushed shut in the faces of people still trying to enter.

That September evening the *Boston Transcript* broke out in strange type and stranger language. "BOSTON NOT TO BE BEAT. Genin Done Brown!", was the way in which the *Transcript* announced that an Ossian E. Dodge, "favorably known as a comedy singer", had climbed to fame as the successful bidder for the first ticket to Jenny's first Boston concert. He had thrilled the crowd in Tremont Temple by paying \$625 for that ticket. And in September, 1850, the *Transcript* cheered in civic pride—as it never would have cheered in later days.



THE COMPANY'S FIRST OFFICE

Kilby Street is at the left. The corner building was 65 State Street

CHAPTER SIX

On the Site of the *Bunch of Grapes*

THE building at 65 State Street, where the Company's first policies were written, stood on the site of a famous old Boston tavern over whose doorway had hung the gilded grape-clusters that were its sign and name. In that pleasant and distinguished meeting-place, the first grand lodge of Masons in America was organized in 1733. Later, in March 1776, it was there that General George Washington was "handsomely entertained" after the British troops had been driven from Boston. The next year, on the news of the Battle of Bennington, it was natural that "at sundown about one hundred of the first gentlemen of the town, with all the strangers then in Boston, met at the *Bunch of Grapes*"—to celebrate the American victory. In 1780, when Lafayette returned from France with word that more help would be given America, it was again the *Bunch of Grapes* in which Lafayette was given enthusiastic greeting. And seven years later still, the Revolution safely won, the historic old tavern was the meeting-place of the group of former Continental army officers who there organized the Ohio Company to begin in earnest (at Marietta) the settlement of the West.

But when in January of 1851, the directors of the Boston Manufacturers Mutual assembled for their first meeting of the new year, they were not thinking consciously of history. As so often happens in Boston, history simply followed them. John Aiken had decided to make his home in Andover, to be nearer the Cocheco Mills. He felt, and the other directors agreed, that



COURTESY OF THE STATE STREET TRUST COMPANY

THE BUNCH OF GRAPES

An artist's careful reconstruction
of the old Colonial inn

the Company's president should be more readily available in this formative period. Retiring as president, Aiken consented to serve as a member of a two-man executive committee. The new president, elected unanimously by the directors, was William Amory.

Considering the meeting-place, that election was one of those odd coincidences that make life so much stranger than fiction. For William Amory's great-grandmother had been the daughter of an early proprietor of the *Bunch of Grapes*. More than that, in the next generation his grandmother had been the daughter of another owner of that same distinguished inn. And William Amory's own office, as treasurer of the Stark and Amoskeag mills at Manchester, was also at 65 State Street—the site of the famous old *Bunch of Grapes*.

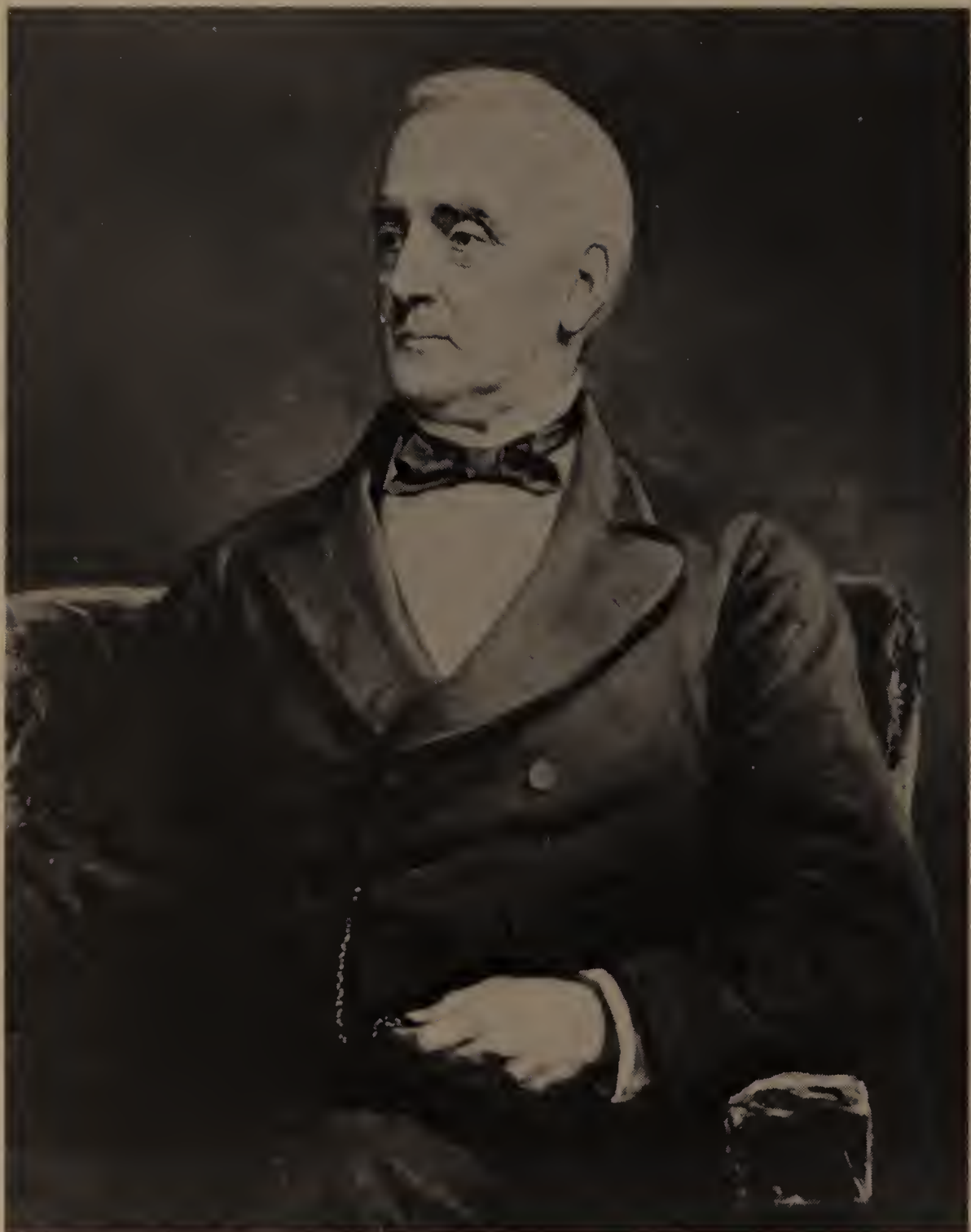
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If the directors of the Boston Manufacturers Mutual had tried, they could not have selected a more interesting and representative Boston figure than William Amory. Nor one better fitted to inspire confidence in the Company's ability and integrity. For one hundred and thirty years the Amorys had been favorably known in Boston. William's great-grandfather had come there in 1720, at the age of 38, after a remarkable business career in London and the Azores. In the latter place he had set himself up as a merchant trader, at the age of 24, carrying on business with Portugal, England, Holland, and America. His surviving letter-books, written with equal facility in French, English, and Portuguese, as he had need, are still treasured as a valuable picture of that business era. A letter written to his agent in the Azores, after he had come to Boston, is splendidly revealing of the business calibre of that great-grandfather:

“Now if the above people (to whom I am indebted) send for these effects, sell anything that belongs to me or take money at interest on my account so that you continue to discharge them—for I had rather be a loser any way than have my reputation in question.”

Integrity was more than an Amory tradition: it was in the Amory blood.

A year after he came to Boston, this great-grandfather had married (in 1721) the daughter of the owner of the *Bunch of Grapes*, a woman of character and ability in her own right. This was amply demonstrated when Thomas Amory was killed in a fall in 1728, leaving her with three small sons—the oldest only 6. She handled the business and the estate so well that fifteen years later, when the eldest son became of age, her accounts showed a balance of 5,000 pounds (more than \$25,000) to the credit of the estate—a substantial sum for the



WILLIAM AMORY

President, 1851-1865

Director, 1850-1872

*"I always find him good company . . . talks
exceeding well, and has a pleasant courteous
way which is exceptional . . ."*

Oliver Wendell Holmes

day. It was this eldest son (William Amory's grandfather) who, by the way, married his mother's niece—Elizabeth Coffin, daughter of a William Coffin who came from Nantucket to be the proprietor of the *Bunch of Grapes* and later a substantial merchant of Boston. The Amory grandfather who married Elizabeth Coffin was also a merchant, and he and his two brothers were fond of walking together each afternoon. In their Colonial dress they were striking figures, and so regular in their strolling that people came to look for them as part of the afternoon scene. As "the three cocked hats," which was their nickname, they were thus long remembered in Boston.

But it would be wrong to infer that William Amory was simply an earlier George Apley—a mere product of family. On the contrary he was a distinct personality, with a career unusual in its varied interests. He was born in 1804 in one of the homes in Bulfinch's famous Tontine Crescent on Franklin Place. His mother was a Linzee, daughter of an English naval officer who had taken part in the bombardment of Bunker Hill. His father, a leading Boston merchant, died when William Amory was 8 but the family home remained in the Tontine Crescent—at 21 Franklin Place, two doors from the house where for some years James Read was later a neighbor. The paths of the two men thus crossed early.

At 15 young Amory entered Harvard, a freshman when Ralph Waldo Emerson was a junior. Among Amory's classmates were George Ripley, later to be famous as a founder of Brook Farm, and Thomas Wilson Dorr who was to be noted as the leader of the "Dorr Rebellion" in Rhode Island. For that matter the class of 1823 is still recorded in Harvard annals as the class of "the Great Rebellion". Described as "uncommonly rowdy", the class specialized in such extracurricular activities as the dropping of cannon balls from upper windows and the balancing of buckets of ink and water to fall upon

unpopular tutors. The climax was reached in the senior year when the expulsion of a popular classmate led to a class revolt that was quelled only by the expulsion, on the eve of graduation, of 43 out of the 70 members of the class. William Amory was one of the 43 who were thus “rusticated”, as the phrase went. He was then 19 years of age, and so unlamblike that he was 41 before he finally made his peace with the Harvard authorities and received a belated degree.

Apparently he was determined not to repeat the family pattern of being a merchant. For he next went abroad with a purpose unusual at the time—to study Civil Law at the University of Göttingen. After several years there, and at the University of Berlin, he returned to Boston and was admitted to the Massachusetts bar in 1831. But almost immediately he again broke with tradition, by abandoning the law to become treasurer of the Jackson Manufacturing Company at Nashua, New Hampshire. He was the first member of his family to enter the textile industry, and he was so successful at Nashua that in 1837 (at the age of 33) he was made treasurer of the Amoskeag Company which was then beginning the great textile development at Manchester. When he took charge, the Amoskeag had just one mill—of 8,000 spindles. By 1851, when he became president of the Boston Manufacturers Mutual, the mills in his charge had grown to 103,000 spindles—with more mills building. Five years later (in 1856) a historian of Manchester was thus writing of William Amory:

“For nineteen years he has been the controlling directing spirit that has fashioned the destinies of our city. Of just and enlarged views, he has suffered no niggardly policy to mingle itself with the management of the affairs of the company. And the directors have had the good judgment to leave his action unrestricted. Today our citizens who take pride in our public library, . . . in our spacious

streets, in our numerous and splendid public squares, so justly considered as ornaments and sources of health to our city, may attribute them in a great measure to the enlightened policy of William Amory, Esq. . . . Few men of his age can look back upon such a record of success in manufacturing as the treasurer of the Amoskeag Manufacturing Company."

But again it would be wrong to think of William Amory as a mere industrialist. Thomas Jefferson Coolidge, after a friendship of more than thirty years, once described Amory as "a prudent and wise business man, but not given over body and soul to the acquirement of wealth, which came to him almost unsought". His life outside of business was remarkable, and unusual even for the Boston of that day. He was a friend of the poet Longfellow, of Daniel Webster; a boon companion of the Autocrat of the Breakfast Table—Dr. Oliver Wendell Holmes. It was Holmes who once said that he would rather talk to William Amory than almost anybody else in Boston. And it was Holmes, the best talker in Boston, who thus described Amory in a memorial address before the Massachusetts Historical Society of which both were members:

"Of all that he (Amory) had seen, of all that he had read, his conversation was full of its rich gleanings. He loved good company, and he was himself always good company. . . . He graced every circle which he entered."

The point could be stressed almost indefinitely, but one more illustration must do. William Amory's sister married William H. Prescott, the historian, and between Prescott (eight years the elder) and Amory there was such friendship that Prescott referred to Amory as "my beloved brother-in-law" and named a son for him. Amory's home on Beacon Street is now part of the Somerset Club. Prescott's home, at 55 Beacon, was in the next block and Amory was gladly received in the circle



COURTESY OF THE MASSACHUSETTS HISTORICAL SOCIETY

The crossed swords of Bunker Hill, from which Thackeray derived the theme of his novel *The Virginians*

of Prescott's literary friends. When Thackeray, the English novelist, visited Boston in 1852, his regard and friendship for Prescott was very marked. And Amory, Prescott and Thackeray visited together, laughed and talked together, before the fireplace in Prescott's home over which hung the crossed swords of Amory's Linzee grandfather (who had been an officer on a British sloop of war, bombarding Bunker Hill) and Prescott's grandfather—the Colonel William Prescott whose “Don't fire until you see the whites of their eyes” is still an American pride in the story of Bunker Hill. It was from those swords, and during the evenings spent with Amory and Prescott, that Thackeray got the basic idea of his novel *The Virginians*.

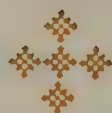
Such, briefly glimpsed, was the background and personality of the new president of the Boston Manufacturers Mutual. It is not known just how or when William Amory joined James Read in the enterprise. As noted before, the Reads and Amorys were for years neighbors in the Tontine Crescent block but it is more probable that it was in the Temple Club, of which

both were members, that the two men talked over Read's plans. It is clear, however, that William Amory, once enlisted, was a prime mover in the founding of the Company. Not only was he a charter-associate and an original director; he was also responsible for drawing in almost a third of the organizing group. There can be no doubt, quartered as they were in the same building, that John L. Hughes conferred often with William Amory, and leaned heavily upon his wide knowledge and judgment.

It is also very clear that William Amory sincerely believed in the Boston Manufacturers Mutual. Just across Kilby Street, at 75 State, was the office of the Firemen's Insurance Company—a joint-stock fire insurance company of the day. The president of the Firemen's was Colonel Thomas Coffin Amory, elder brother of William Amory. But brotherly love notwithstanding, the Colonel would not insure cotton mills in the Firemen's. He was blunt in his statement that he *would* insure a cotton mill to burn . . . but not against loss by fire, no matter how high the premium offered. Nor did he. It is significant that in a surviving list of the companies insuring the mills at Manchester in 1851, the name of the Firemen's Insurance Company does not appear. On this point the brothers differed, each with firm conviction. And it is also significant of William Amory's faith in the Boston Manufacturers Mutual, and factory mutual insurance, that the surviving list shows a total of \$90,000 insurance (on three mills) carried by the new Company—not six months old—of which he had just been elected president. Not only was that \$90,000 twice the line carried by any other company, it was also more than twenty per cent of the total insurance of \$440,000 shared by eleven different companies.

That insurance was no mere gesture. William Amory's personal stake at Manchester was involved. There was also his

personal liability in any possible failure of the new Company. At that time the laws of Massachusetts, as William Amory well knew, put no limit upon the personal liability of the president and directors of a mutual company, for any loss or series of losses that could not be met from Company funds. Furthermore, as the Company grew, so also did William Amory increase his risk in its fortunes. During the 1860s he had the largest amount of insurance of any single policyholder—his mills at Manchester, in 1867, carrying insurance in the Boston Manufacturers Mutual to a total of \$823,000. That insurance stood for William Amory's faith and firm conviction . . . expressed in action, not in mere words.



CHAPTER SEVEN

The First 100 Policies

WHEN William Amory became president, in the middle of January, 1851, the Boston Manufacturers Mutual had been in operation four months and was about to issue its 100th policy. Viewed as the seed from which grew a great enterprise, those policies offer an interesting analysis. Ninety-three covered cotton mills and related risks, while six insured woolen mills and one a carpet factory. They represented a total of \$2,051,275 at risk, distributed over eight States.

Forty-three of those policies covered in Massachusetts, thirty in New Hampshire, seven each in Maine and Rhode Island, six in Connecticut, four in New York, two in Pennsylvania, and one in New Jersey. The low showing of Rhode Island against the heavy preponderance of Massachusetts, New Hampshire and Maine (7 policies against 80) is interesting. John L. Hughes, secretary of the Company, had been raised and trained in Rhode Island and knew its mills well. Seemingly it would have been natural for him to turn to that field, perhaps to make a quick showing. But as those policies show, he evidently (and wisely) preferred to build more solidly. Right from the start the Boston Manufacturers Mutual carved out its own field.

Those first policies are interesting from another angle. The cotton textile industry of America developed under two principal systems. Although there had been a cotton mill at Beverly, Massachusetts, in 1787, the industry's real beginning is

generally credited to Samuel Slater who in 1791 put into operation in Rhode Island a pioneer mill of 72 spindles “tended by nine children.” It was a spinning mill, making only thread. The weaving of the thread into cloth was done outside the mill—on small looms worked by hand in the homes of the weavers. From that mill of Slater’s developed what was known as the “Rhode Island system” of cotton manufacture. It was characterized by small mills owned by individuals or partnerships, the employment for labor of whole families, and payment in scrip to be used in trade at mill-owners’ stores. It followed, in short, the English system under which Samuel Slater had been trained.

But in 1814, Francis Cabot Lowell, Nathan Appleton (later the father-in-law of the poet Longfellow), and other Boston men, set up at Waltham, Massachusetts, the first cotton mill in this country in which all processes—from the opening of the cotton bale to the finished cloth—were done under one roof. Lowell and Appleton had visited England and been appalled by the conditions they saw among the workers in the factory towns. To avoid such dependent “factory populations”, Lowell and Appleton decided to tap a new source of labor—the New England farm girls (young women, not children), for whom till then there had been no employment available other than housework and limited teaching. For those young women there were provided clean and well-built boarding houses, operated under careful company supervision—the idea being that when work was slack the young women would not be thrown on the town but could return to their farm homes until needed. In addition, all wages were paid in cash—a profound and startling innovation in that day.

Waltham also introduced to textiles, and to American industry in general, the corporate form of business organization. The Waltham company began operations in 1814 with a capital



“WALTHAM SYSTEM” BOARDING HOUSE

This substantial brick block of the Pepperell Manufacturing Company was built about 1848. It contained 16 separate houses, each with its own carefully chosen boarding mistress to safeguard the young women workers. The system was the first organized attempt at employee welfare in American industry

of \$300,000, soon increased to \$400,000 and then to \$600,000—huge sums for textiles, and for industry, at that time. By contrast, as late as 1831 the average capitalization of the cotton mills of Rhode Island was “less than \$45,000”—due, in part, to the State’s small rivers whose waterpower was best suited to mills of less than 1,000 spindles. But the first Waltham mill began with 1,700 spindles; by 1823 the first mill at Lowell began with 6,000 spindles—a figure that quickly grew to 15,000 and 20,000 spindles per mill as bold engineering brought into play the latent power of the Merrimack River in Massachusetts and New Hampshire, and the Saco and Androscoggin Rivers in Maine.

Thus was set the pattern for what was called the “Waltham system” under which Lowell, Manchester, Lawrence, Chicopee, Great Falls, Biddeford and Lewiston, were built. Cor-

porations, with large capitalization; big mills, large-scale operation, heavy values; cash wages, and employee boarding houses—such were the distinctive features of the “Waltham system” that revolutionized New England’s textile industry (and New England industry in general) more than a century ago. That system was founded by Boston men, and centered in Boston—its sphere of activity primarily developed north of Boston; in Massachusetts, New Hampshire and Maine. The heavy preponderance of those three States in the first 100 policies issued by the Boston Manufacturers Mutual is thus explained. It was with the mills of the “Waltham system” that the new Company found from the start its own field of service.

William Amory and the other directors of the Company were all “Waltham system” men, functioning easily in the large-scale operations and values that characterized it. More than that, they were all prime movers and executants in the great growth of that system during the 1840s and 1850s—a period in which the spindles of New England swelled from a million and a half in 1845 to four million in 1860. Their intimate knowledge of that development—the mills, and the men and corporations behind them—was thus a marked asset in the early underwriting of the Boston Manufacturers Mutual.

Fire insurance underwriting, a baffling and mysterious thing to the layman, is fundamentally concerned with two factors—the “moral hazard” and the “physical hazard.” To a newcomer in Boston, such as John L. Hughes, the moral hazard would have been difficult to judge—and it was there that the varied contacts and acquaintances of William Amory and the directors came into play. Questions of a mill’s financial condition, its success in marketing its goods in a highly competitive market, the character and ability of its management, its record in living up to contracts and agreements—all such questions were in-



COURTESY OF THE BOSTONIAN SOCIETY

State Street during 'Change hours,
showing the crowded sidewalks

volved in the moral hazard, and for their answers William Amory and the directors took full responsibility.

Also important was the fact that the building at 65 State Street, on the site of the ancient *Bunch of Grapes*, was admirably located to tap the most remarkable source of business information then in Boston. In front of that building there swirled and jostled each day, from noon to 2 P.M., that picturesque old Boston institution known as 'Change. Between those hours the State Street sidewalk from Kilby to Congress was jammed with men in the stovepipe hats then popular, seeking or exchanging information on every phase of Boston's far-flung commercial, industrial and financial interests. If a mill manager was dissatisfied or neglectful, if dissension among owners was changing a mill's prospects, if over-confidence was taking too much risk for safety—the news was quickly bruited “on 'Change”. The sea trade of New England, its industry, its

great share in the railroad development of the West, were all centered on that sidewalk—and there discussed, financed, and kept moving. That sidewalk institution of 'Change disappeared by 1860. But in the early 1850s it was still so remarkable that a Maine business man, writing home from California during the great Gold Rush, could compare the crowded streets of San Francisco only to Boston's State Street during "'Change hours".

William Amory, James Read, William Dwight, John Aiken, and the other directors of the Boston Manufacturers Mutual, were highly skilled in the use of 'Change—that oldtime counterpart of Dun and Bradstreet, of Moody, of the stock ticker and financial journal, all rolled into one. They thus laid the foundation for the proud claim made fifty years later by Edward Atkinson, then president of the Company, that the Boston Manufacturers Mutual had never had a loss due to moral hazard. It was a claim much envied, and marvelled over, in general fire insurance circles. And it was true.

The other main factor in fire insurance underwriting, the "physical hazard", was largely the responsibility of the Company's secretary, John L. Hughes. By physical hazard was meant the fire possibility inherent in any manufacturing. It covered the nature of the materials used, the construction and arrangement of buildings and machinery, the various operations through which the product passed—and, particularly, the degree to which such hazards were offset by careful management and by provisions for detecting and extinguishing any fires that might occur.

Through his practical manufacturing experience, the fire hazards inherent in textile production were well known to John L. Hughes. They were the hazards of overheated machinery, through friction in moving parts; of slack manage-

ment, in failing to keep machines and floors free from oily waste and the dust-like inflammable lint that accompanied cotton handling. Especially, the cotton mills were noted for picker fires caused by sparks from pebbles and other foreign objects as the raw cotton passed through the iron teeth of the picker. From those frequent picker fires arose the strong inclination of the general fire insurance underwriter to lump all cotton mills together as extra hazardous—and either to refuse to insure them (like Colonel Thomas C. Amory) or else to charge a rate based upon the high loss record of the poorest of the class.

It was against that last practice that Zachariah Allen had rebelled so sharply in 1835, and John L. Hughes had joined him in that rebellion. The situation was even more acute in 1850, due to the better type of mills being built under the “Waltham system.” In Zachariah Allen’s letter of 1849 to James Read, it will be noted that he speaks of “recent improvements in the more secure construction of modern mills, of more secure modes of warming them, of regular watching, and of more efficient force-pumps.” Thus, by inference, he separated what he called “the first-class of cotton mills” from what, in the same letter, he referred to as “third rate risks.” Incidentally, it was Zachariah Allen’s idea of insuring only “the first class” of mills that was the fundamental basis of all factory mutual insurance. Where the general fire insurance underwriter tacitly accepted the status quo, the factory mutual procedure was to set a standard—and work up to it.

But unfortunately that vague reference to “recent improvements” in Allen’s letter of 1849 is the only contemporary record of what was considered “first-class” in 1850. All other accounts were written years later, and from a retrospective viewpoint that ignored or telescoped the actual rate of advance. The nearest record in point of time, set down by a competent

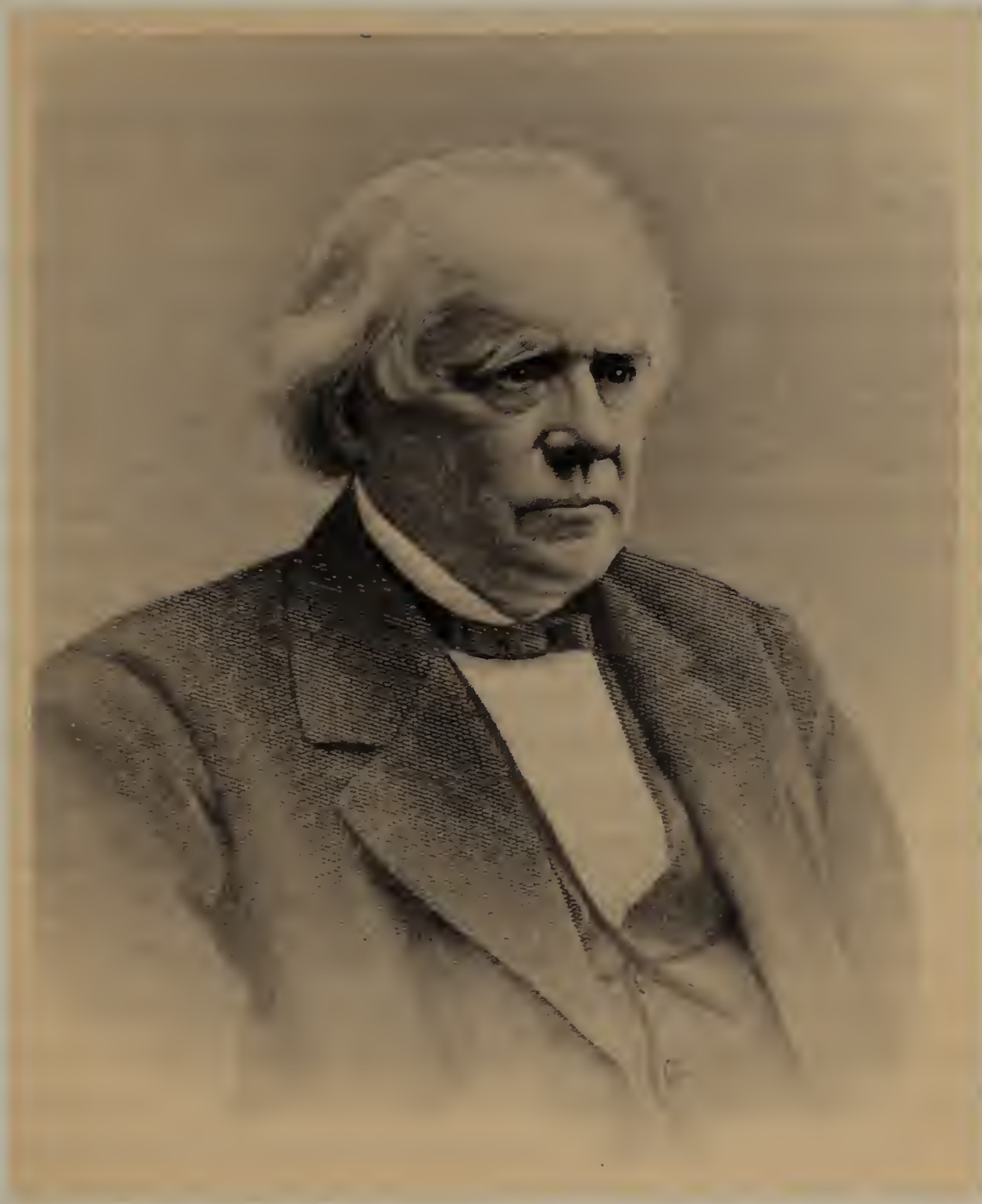
hand, is the report of the firefighting equipment of the Lowell mills. Published in 1865, in the *Journal of the Franklin Institute*, it was written by James B. Francis, the remarkable self-made hydraulic engineer whose ability was so outstanding that in 1837, at the age of 22, he had been made chief engineer of the Locks and Canals Company—responsible for the waterpower, the water supply, and the important firefighting equipment of Lowell. His 1865 report is thus an authoritative statement and deals with the city that had been the textile showplace of America, and the pattern in much of the spread of the "Waltham system."

Francis opened his report with a bit of history:

"The first cotton mill at Lowell went into operation in the year 1823; it was provided with force-pumps which supplied a cistern in the roof and a hydrant in each story. There were no hydrants outside the building. All the cotton mills erected in Lowell previous to the year 1828 were protected in the same manner. In January of that year a mill was burned down, and the want of some more efficient means of extinguishing fire was clearly shown. The plan was then adopted of laying an eight-inch main pipe through each mill yard, about forty feet in front of the mills; the pipe was furnished with hydrants and was connected with the force-pumps and roof cisterns of each mill."

Francis further noted that "an efficient system of watching had been adopted from the first, and great care was constantly exercised in guarding against fire and in keeping up the apparatus for extinguishing it."

An earlier statement, by a Lowell minister, adds to the picture. In 1845, when there were 27 mills at Lowell, operating 200,000 spindles, the Reverend Henry A. Miles published his book, *Lowell, As It Was, and As It Is*. From that book it is clear that by 1845 the standard of first-class cotton mill con-



JAMES B. FRANCIS

"The credit for the most complete system of protecting a great range of hazardous factories from loss by fire, belongs to James B. Francis of Lowell more than to any other one man."

Edward Atkinson

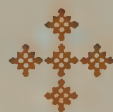
struction included the removal of the picker room from the mill. The clergyman's wording runs:

"The picker rooms are two small buildings standing a few feet removed from the mill, and are made fire proof, in order to guard against ignition which is liable to ensue from the great rapidity of the machinery."

He also describes the careful housekeeping and constant watchfulness in which Lowell was a model for the industry:

"Each mill (wrote Miles) has two watchmen on duty day and night, who relieve each other at intervals of six hours. . . . There is a head watchman, having charge of the night watch who are required to pass through every room in the mills a prescribed number of times every night. . . . Each room likewise, has one woman . . . who does nothing but keep the room clean by constant washing, scrubbing and sweeping."

As a result of that protection and that care, the fire of 1828 was the only serious fire experienced in the numerous mills at Lowell in the thirty years from 1823 to 1853.



CHAPTER EIGHT

A Glimpse of Early Underwriting

JOHN AIKEN, the first president of the Boston Manufacturers Mutual, and thereafter the senior member of its executive committee, was closely familiar with Lowell standards. He had gone to Lowell in 1834, the same year as James B. Francis, and until 1849 had been in charge of two different Lowell mills. As for William Amory, the early mills at Manchester had been built on the Slater "Rhode Island system" and equipped with Slater machinery in 1826. But when Amory took charge at Manchester in 1837, he immediately began building on the Lowell pattern and following the "Waltham system." Moreover the first mill he had built at Manchester (in 1838) was seriously damaged by fire on March 16, 1850, just a day after the Boston Manufacturers Mutual had been granted its charter. Thus William Amory was not only familiar with Lowell standards but had further had their importance impressed on him by that recent fire. Charles S. Storrow, then planning and building the mills at Lawrence, must also have studied Lowell and conferred with James B. Francis.

Thus it is interesting to review the Company's early policies to see, if possible, whether John L. Hughes followed in his underwriting the same Lowell standards known to the directors—or a differing standard, perhaps peculiar to himself. Unfortunately, only a few clues to his underwriting have survived in the Company's early policy books—in occasional notes of special stipulations upon which the insurance was based. The first of these stipulations was made on September 28,

1850, on the 49th policy issued. That policy covered a brick woolen mill at Southbridge, Massachusetts. The amount was \$10,000, at a rate of \$1.50 per \$100 of insurance, and the special stipulation (still to be seen in the old handwritten policy book) runs as follows:

“This policy is made with the express condition that a Forcing Pump to extinguish fires, with adequate hose of approved kind, shall be furnished and ready for use within thirty days from date. Another condition also is, that some competent person shall be employed to remain in the Factory for one hour after the mill is stopped at night.”

The first condition, requiring a “Forcing Pump,” is clearly the characteristic factory mutual idea of raising a risk to a standard. But the second provision, a watch service of one hour only, is a sharp departure from the Lowell standard of constant watching, day and night.

Oddly enough that queer reliance on such partial watchman service occurs again and again. The record of the 88th policy, issued January 1st, 1851, contains a pencil note: “No watch at the Mill in the Summer.” On a third policy, issued after the Company had been in operation a full year, there is this pencil notation: “There is no watch clock; the watchman attends to two mills.” As late as January of 1853, Hughes issued a policy for \$10,000 on a brick cotton factory at Kinderhook, New York, with this quaint and naive stipulation:

“This policy is made with the understanding that the mill is to be watched for the space of one hour after stopping all work every working day in the year—the time to be occupied in passing through the different rooms of the Factory—and that the watchman shall also pass through the Factory every night before bedtime.”

Not until August of 1853 did Hughes require "a constant watch, day and night." And that stiffening significantly followed a serious fire at Manchester, and the second great fire at Lowell which on June 15, 1853, destroyed a mill of the Merrimack Company. The fire in the Manchester Print Works occurred in the morning; the fire in the Merrimack mill at Lowell was also in the morning, "while the operatives were out at breakfast." They gave bitter proof that an hour or two of watch service at the close of work was rather trifling protection.

On the point of the cleanliness so noticeable at Lowell, the requirements made by Hughes seem again oddly at variance. Not until June of 1852 does any policy insist on regular waste removal, and even then Hughes was not consistent. The policy of 1852 required "that all of the waste shall be removed from the Factory and from the Picker House every night," but the second instance of such a stipulation is not found until the next year (on August 20, 1853) and then only "that the waste shall be removed as often as once in 48 hours."

It was June of 1854 when John L. Hughes seems to have reached a strict and definite standard. The 793rd policy he issued was dated June 13, 1854, and covered \$10,000 on a brick cotton mill at South Berwick, in Maine. The stipulations still recorded in the old policy book were the most thorough-going written to that time. The wording runs:

"This policy issued with the understanding that a watch clock shall be furnished; that a watchman shall be employed every night; that the waste shall be removed every day; and that a sprinkler shall be furnished for each room in the Picker Building containing Picker Machinery."

That mention of "a sprinkler" is the first to be found in the old policy books. The mill was a "Waltham system" mill, and the mention of sprinklers is of special interest as supplementing

the report of James B. Francis on Lowell. In his 1865 review, Francis noted that the sprinkler “was first introduced at Lowell in the year 1845, into the picking room of the Suffolk Manufacturing Company.” Next, “in 1852 and 1853, sprinklers* were put into the roofs of the mills . . . a very great security against heavy losses by fire.” The final (and obvious) step took 6 years to complete. Said Francis:

“Between the years 1853 and 1859, sprinklers had been introduced into many of the carding and spinning rooms of the cotton mills, which rooms are particularly liable to the rapid spread of fire. In the year 1859, sprinklers were required to be put in all such rooms, as well as into all picking rooms, and all other buildings and rooms liable to the rapid spread of fire or of difficult access.”

In other words, even at Lowell, the textile showplace, such a decided advance as the perforated pipe sprinkler took 14 years (from 1845 to 1859) for complete adoption. And the 1854 policy written by John L. Hughes on the “Waltham system” mill at South Berwick shows that the Lowell example was spreading just as slowly outside.

One other point is significant in the old policy books. Of the first 48 policies issued, 33 covered mills built under the “Waltham system” and those 33 carried the lowest rate of insurance—90¢ on each \$100. They evidently represented “the first-class of cotton mill.” But the risks later taken, of which examples have been given above, were plainly not all first-class. And the gradual stiffening in requirements shown by Hughes in his underwriting may perhaps be taken as a measure of his increas-

*Not to be confused with the “automatic sprinklers,” which were not invented until later. The sprinklers to which Francis referred were simply lines of pipes with small perforations at regular intervals—whose water supply had to be turned on by hand, as needed. Even thus limited, the perforated pipe sprinkler was a great firefighting advance.

ing contact with, and appreciation of, the high standards of Lowell and the other "Waltham system" mills.

The record of that early underwriting has further value. It shows clearly that William Amory and the other directors of the Boston Manufacturers Mutual, gave John L. Hughes a very free hand on questions of "physical hazard." Once more their calibre is thus revealed. They were men accustomed to large-scale operations, habituated to decisive judgment, and skilled in delegating responsibility to an extent impossible to less able men. Their course with John L. Hughes was thus quite in character.



JOHN L. HUGHES
Secretary and Treasurer, 1850-1857

CHAPTER NINE

Five Years

BY MODERN factory mutual standards the treatment of physical hazard and the early fire underwriting of John L. Hughes appear strangely empirical and dangerous. Yet they were not merely in keeping with the fire insurance practice of a century ago—they were, actually, much above the average of general underwriting in that day. Fire insurance was still young; Massachusetts, for example, did not set up its supervisory board (of three insurance commissioners) until 1854 and was then the first New England state to do so. There was no standard policy form, no building code, no rating standard. To use the old New England vernacular, the operations of the average general fire insurance company in the 1850s were purely “judgmatical.” The horrified avoidance of *all* cotton factories, by Colonel Thomas Coffin Amory, is a case in point.

But the first results of John L. Hughes’ underwriting were sharply contrary to any “judgmatical” prediction the Colonel may have made to his brother, William. Those results gave much quiet satisfaction to William Amory, to the other directors, and to the members of the Boston Manufacturers Mutual. For in January, 1852, John L. Hughes reported at the Company’s annual meeting that in the sixteen months of operation there had been written almost \$3,500,000 in insurance—against which there had been losses of less than \$2,000. As a result, there had been returned to the members more than three-fourths of the original premiums paid—making the net cost

of insurance about 25¢ per \$100 of insurance. How satisfying and encouraging those results were, is made clearer when it is recalled that before the organization of the Boston Manufacturers Mutual the limited insurance available on mill property from the general fire insurance companies was costing anywhere from \$1.25 to \$1.75 per \$100 of insurance.

The Company's operating plan called for a regular monthly meeting of the directors, and during 1850 the attendance was marked. But as Hughes grew more familiar with his new field of work, any supervision by the directors was tacitly left in the capable hands of William Amory, John Aiken, James Read and William Dwight. Between Amory as president, and Aiken as a member of the executive committee, there was informal agreement that one or the other should be in attendance at every meeting. This agreement was faithfully carried out during 1851 and 1852. But after the annual meeting of January, 1853, at which Hughes reported \$4,000,000 of insurance written (during 1852) with losses of only \$6,500, it was evidently decided that only one formal meeting of directors was needed each year. From 1853 to 1857 that plan was followed, the directors coming together only for special meetings as problems might require.

The fact is interesting because 1853 was marked by the first heavy loss yet encountered—one of \$30,000, from a fire in the Manchester Print Works. This was also the year in which the Merrimack Mill at Lowell was destroyed, causing James B. Francis to turn more actively to sprinklers for protection. While that latter blaze meant no loss to the Boston Manufacturers Mutual (the Lowell mills then had their own system of self-insurance) the total destruction of a mill thought so well protected might easily have shaken the confidence of the directors—particularly when coupled with the sharp rise that year in the Company's own losses. But again they showed

their strong fibre; they had been trained in an industry almost as familiar with (and dependent upon) the law of averages as was fire insurance. Instead of dwelling upon the jump in losses (from \$6,500 in 1852 to \$31,601 in 1853) they calmly balanced that jump against the very marked gain of 25 per cent in insurance written. The volume of insurance that year exceeded \$5,000,000—just about double any volume so far written in one year by any factory mutual company.

So there was not even a special meeting called, and the next year's results justified that steady-nerved course. For 1854 saw insurance written of \$6,300,000—against the remarkable figure of only \$2,715 in losses, less than 5¢ for each \$100 of risk taken. Of the 314 policies issued that year, a total of 207 (or about two-thirds) covered mills in Massachusetts, New Hampshire, and Maine. The remaining 107 were scattered over five other states—Rhode Island (55), Connecticut (29), New York (20), Pennsylvania (2), New Jersey (1).

Those figures of volume seem small today. But against the background of their own time they take on real importance. In 1854, when the Boston Manufacturers Mutual wrote \$6,300,000 in insurance, no other factory mutual company had reached even the figure of \$3,000,000 in any one year. Thus John L. Hughes, faced with the problem of personal adjustment to a new field, had also to meet an even more severe problem—that of adjusting his mind to a scale of underwriting (and risk-venture) much greater than anything known by any factory mutual underwriter up to that time. The lines of insurance he wrote, on the class of risk taken, were far heavier than those written by any other company (stock or mutual) in the field. Moreover they were net lines; the cushion of reinsurance was then unknown. No man in the least acquainted with fire insurance underwriting, can fail to realize the strain that his very success put upon John L. Hughes.

His portrait reveals a man sensitive, high strung, vulnerable to nervous tension. There is evidence that he broke physically under the strain. A special meeting held by William Amory, John Aiken, James Read, and William Dwight, on November 7, 1854, reveals that Hughes (then in his 59th year) had been struck down by illness. It was four months before he could return to duty. When, after that illness, the signature of John L. Hughes again appears in the old minute book it is under the record of a special meeting of March 22, 1855. And that signature is so faltering that it could have been written only by a much enfeebled man.

But that illness did not immediately show effect upon the Company's affairs. In spite of Hughes' long absence, and weakened condition, the figures for 1855 disclosed another surprising gain. Losses, it is true, were again erratic—rising to \$37,000 from the very low \$2,700 of 1854. But those losses were still moderate when compared with the new high of more than \$7,000,000 reached that year in insurance written. The Company did no advertising, and had no agents; Hughes had been sick and weakened during much of 1855. That gain of 11 per cent in volume can therefore be taken as some measure of how word-of-mouth praise was now following the Company's operations.

Thus ended the first five years of the Boston Manufacturers Mutual Fire Insurance Company. A total of almost \$26,000,000 had been written (and risked) in insurance. The losses had totalled only \$80,000—about 31¢ on each \$100 of insurance. The policyholders had paid in original cash deposits of \$254,000, of which \$150,000 had been returned to them by the Company . . . as not needed to pay losses or expenses. The net cost of insurance had been thus brought down to 40¢ per \$100—where without the Boston Manufacturers Mutual, those same policyholders would have been forced to pay from \$1.25

to \$1.75 for such insurance as could be had from the general fire insurance companies. Clearly the new Company had earned the good word-of-mouth advertising it was receiving.

As remarkable as those first five years had been for the Boston Manufacturers Mutual, they were equally remarkable for the city of Boston. It must always be remembered that the office of the Company was not located in a vacuum, aloof from the world. John L. Hughes, William Amory, James Read, and the other directors, did their work and made their decisions under the pressure of distraction and excitement in current news and unusual event. The census of 1850 had shown a gain of 46 per cent in Boston's population—from 93,000 in 1840 to 136,000 in 1850. But the growth in land area, by the annexation of suburbs, had not begun and Boston was still largely confined to the peninsula of less than 1,000 acres on which William Blackstone had settled more than two centuries before. It was still, as someone has said, a city "where one could go anywhere in ten minutes." A story told of William Amory throws a needed light upon the times. He was slender, of medium height, and as a rule he spoke gently. But there is tradition that once, in some emergency, he stood on the steps of his Beacon Street home and summoned—by calling!—a policeman who stood on the Tremont Street side of the Common. As that story shows, Boston in some ways was certainly quieter then. But Boston, like William Amory, could also shout (and roar) on occasion.

One of those occasions came as the Boston Manufacturers Mutual completed its first twelve months of active operation. In September, 1851, the city of Boston held a great Railroad Jubilee to celebrate the opening of an all-rail route that linked Boston to Canada—as already she was linked to the West by rail, and to Europe by a direct steamship line to Liverpool.

Boston and its Railroad Jubilee were then of sufficient importance to draw President Millard Fillmore and his Cabinet from Washington, and Lord Elgin (Governor-General of Canada) and his suite from Montreal. More than that, the President and his Cabinet stayed for the three full days of the celebration—being entertained by a cruise around Boston Harbor, by reviews, receptions, and by so many and such elaborate dinners that President Fillmore had to beg off on the last day—from further eating.

The Railroad Jubilee wound up with a great parade that as part of its route marched valiantly, bands playing, under the flags that hung across State Street—and on past the site of the old *Bunch of Grapes* and the Company's office at 65 State. No work was done on the street that day. The great parade ended with a dinner on the Common at which nearly 4,000 people sat down to eat, to cheer the orators of the day, and to marvel at the "fireworks and illuminations" that flared brilliantly against the September evening sky. Said a Boston report proudly: "However extensive and brilliant may have been the public pageants on other occasions, not one, it is believed, has on this Continent surpassed, if any have equalled, that of September 17, 18, and 19." Again, to use the *Transcript's* exultant phrase, Boston was "not to be beat!"

That there was more than air behind that Jubilee is shown by the fact that in 1855 the Boston Almanac was reporting that Boston's Canadian trade was already more than \$5,000,000 a year. By then 61 railroads had been chartered in Massachusetts, and a rail link with Chicago opened. Boston's commerce then included 145,000 tons of ice from New England ponds and rivers, shipped (in one year, 1854) from Boston Harbor in 492 vessels . . . to remote cities and lands unblessed by New England climate. And that same Almanac of 1855, as another measure of lively progress, was declaring that from New

England's textile mills there was pouring a volume of "home manufactured dry goods, *distributed from Boston*, (that) cannot be less than \$50,000,000."

Boston's population in 1855 had just reached 150,000. But its commerce, its interests, its spirit, touched the whole of the Western Hemisphere and all of the Seven Seas. It was the Boston of this period that was summed up in a pithy sentence by Dr. Oliver Wendell Holmes, friend of William Amory. Said Holmes: "The heart of the world beats under the three hills of Boston."



A BALLOON VIEW OF BOSTON IN 1850

The Public Gardens were then about half their present size, and all of Back Bay was still under water

CHAPTER TEN

A Testing Year

IN THOSE five eventful years at 65 State Street, the losses of the Boston Manufacturers Mutual had amounted to only 31 per cent of the premiums paid in. Considering the class of risks insured, the relative crudeness of the fire protective measures then known, that loss ratio was genuinely remarkable for the time—and still would be, even today, by any standard of experience in general fire insurance underwriting. In other words, those five years had been years of unusual success. No one year had shown more than one serious loss. But now the Company was to experience twelve months in which there were four serious losses. That old *bete noire* of the fire insurance underwriter, the law of averages, had been simply biding its time.

Success has its way of proving institutions, and men. But far more searching are the tests of adversity. The young Company's bad twelve months began without warning in the summer of 1855. At one o'clock of a Sunday morning, July 15th, a watchman on his regular round was passing through the carding-room of one of the mills of William Amory at Manchester, New Hampshire. In the darkness, in the quiet room, the watchman's lantern threw its wavering light. Suddenly the bottom of the lantern came loose; by one of those turns of fate that seem actually spiteful, the lighted oil-lamp from the lantern fell into a pile of fluffy cotton. The watchman snatched at the ready fire-buckets, but the flames leaped too fast. He then ran for the mill bell, and the clanging alarm

broke the pre-dawn peace of that July Sabbath. Men roused, startled, from sleep; help soon came to start force-pumps, to drag out hose and get hydrant-streams playing—but the flames already were licking savagely from the mill windows. Four hours of desperate struggle finally stopped the fire, but not until half of the big mill was destroyed.

It was one of those fires that appear to mock at all care and precaution. The share of the Boston Manufacturers Mutual in the insurance on the mill jumped the Company's losses to the highest figure yet experienced. Fortunately the balance of 1855 was fairly loss-free, and the year ended with a ratio of 53.8 per cent in losses to premiums—a figure not too dangerous.

Then 1856 came in. During February the Company's office was moved to the new City Exchange Building on Devonshire Street, close to the historic old State House. In that same month came the next serious loss; again it was an early morning fire. This time there were circumstances linked with the Company's share in the total insurance that certainly invited the soul-searching ordeal known to all fire insurance underwriters . . . the critical and criticising review of underwriting action, done in the dismal (and very harsh) light of after-the-event judgment. In late November, 1855, John L. Hughes had issued a short-term policy for \$5,000 on a stone cotton factory at Bristol, R. I., known as the Pokanoket Steam Mill. How long the mill had been standing is not known, but it probably was not new. In any event, John L. Hughes had had the bad luck to insure that mill when it was close to catastrophe. Actually, Fate seemed to tease him a little—that first policy, for \$5,000, ran its short course to February 1st, and expired without accident.

On February 1st, Hughes issued a renewal policy, this time for a full year's term . . . and also increased the amount to

\$20,000. That ill-fated renewal policy had a life of less than two weeks. At 2 A.M., on Wednesday, February 13th, 1856, a fire broke out in the Pokanoket factory that ironically spared the most hazardous buildings (the engine house and picker) but totally destroyed the main mill. If that fire had come on or before January 31st, the Company would have had a loss of only \$4,000. The happenstance of a two weeks' delay in that fire gave the Company a loss of \$16,000. Which is what made oldtime fire insurance underwriting often nerve-wracking.

The mill property, buildings and contents, of the Pokanoket were valued at \$110,000. The insurance of \$70,000 was divided among six companies, and the \$20,000 policy of the Boston Manufacturers Mutual stood out like a sore thumb in the insurance list that showed no other company involved for a policy of more than \$12,500. Thus there was plenty of material for a critical analysis—but it is to the great credit of the Company's directors that no such ordeal was staged. The Pokanoket loss was taken in stride; there was no meeting of the directors held to consider it.

But in barely three weeks the Company was hit savagely again. This time it was a Massachusetts mill, the Essex Steam Mill at Newburyport. At a little before 10 o'clock on the night of March 7th, a passerby was startled to see flames licking out of windows on the mill's top floor. The alarm was sounded, the volunteer firemen turned out, but the situation was hopeless. The mill was twenty years old, built of wood, three stories high; with sheathed walls and roof that made convenient flues for the spread of flame. Worse still, the mill was built on a wharf extending into the river—the firemen could not get hose lines around it. A strong March wind blew from the north; in an hour the mill with its 7,000 spindles, its 180 looms, was burned to the ground. The glare of that fire against the sky was seen in Salem, 20 miles away, and so clearly that a

Salem fire company started out—thinking the fire was in a Salem suburb.

The Essex Steam Mills were capitalized at \$100,000. The mill had been insured in the Boston Manufacturers Mutual from the beginning; the fifth policy Hughes had issued in September, 1850, covered \$10,000 on this mill. The rate charged on that policy was \$1.50 per \$100, indicating that the mill was extra-hazardous. But in July of 1855, the old policy books show Hughes to have reduced the rate to \$1.25 . . . and, more remarkably, to have increased the amount of the policy to \$20,000. Under another policy he had risked \$3,500 more on a frame storehouse so close to the mill that it was destroyed by the same fire. Thus the Boston Manufacturers Mutual had suffered a loss of \$23,500—on a risk that only three other companies would insure, and none for so large an amount. Two of the other companies had policies of \$10,000 each; the third's policy was for \$5,000. That fire, and that list of insurance, brought the first semblance of a critical review.

No question of moral hazard was involved. The mill and its contents were valued at \$90,000; the total insurance was only \$45,000—not enough to rebuild the mill, or to pay off even half of the capital stock. The stockholders (half of whom were in Boston, and half in Newburyport) lost \$55,000 over and above the insurance. As for Newburyport, and the 200 jobless employees, the town newspaper said emphatically: "A half million dollars lost in freighting ships would not have been so much felt as the burning of this mill." No one wanted the Essex to burn.

But on the score of physical hazard, John L. Hughes was vulnerable. An old wooden mill, built on a wharf on the bank of the Merrimack River, and unusually difficult of access in case of fire—such a risk, even by the embryonic standards of underwriting in that day, was not one on which to carry a policy of

\$20,000. There had been, to put it mildly, a definite error in judgment.*

Such was the background when the directors assembled on March 21st, 1856, just two weeks after the fire. By chance it was their first meeting in the Company's office in the new City Exchange Building. It could easily have been an unhappy meeting, marked by nagging recrimination and bitter personalities. That it was not, is again a tribute to the sound ability of the men who stood behind Hughes—the men who by law were personally responsible in any financial failure of the Company that might be risked in Hughes' underwriting practice. James Read was present at that meeting. William Dwight was there, and Dwight had small patience with fumbling or incompetence. William Amory and John Aiken were there, both of them keen judges of men, and both genuinely independent in their judgments.

Present also was Francis Skinner, dean of the textile industry in Boston. Skinner, who had come on the Board in 1854, belonged to the pre-1800 generation of textile builders. Born in 1797, son of a humble village doctor, he had left home early to make his own way. By twenty-five he was a partner in a Boston commission house; before he was thirty he headed his

*A surviving letter written by Hughes in 1852 suggests a probable reason for his having raised the insurance and lowered the rate on the Essex mill. This letter reveals that Hughes attached great importance to the use of live steam to quickly extinguish a fire. The Essex mill used steam, not water, for power—and had recently installed a more powerful steam engine . . . which may have influenced Hughes in his underwriting. It is definitely known that there was great rivalry just then between steam mills and waterpower mills on this point—the steam mills claiming that “steam may be made *more reliable* and *effectual* in extinguishing fire . . . than water.” The quotation, including italics, comes from an 1851 letter written by the Agent of a Portsmouth, N. H., steam mill, and approvingly distributed by Hughes. Unfortunately the Essex mill fire happened at night, when steam pressure was low.

own business; at forty he had weathered the great panic of 1837 so ably that thereafter he was a recognized leader in Boston business circles. With William Dwight he had put into production the Pepperell mills at Biddeford, in Maine; he had planned and established Pepperell's merchandising and manufacturing success; had brought into being its famous "dragon" trademark. Quick and abrupt in speech, Francis Skinner was no man to equivocate, or to conceal his opinion. But, like the other four directors at that meeting, he well knew that no man is infallible, that every executive has his moments of blindness, his occasional lapse in judgment . . . and that every man intrusted with responsibility is entitled to a review of his whole record before any one point is picked on. That type of knowledge, that type of mind, does not fall into the trap of scapegoat-blaming.

So there was no bitter criticism at that March meeting of 1856. The five directors who then met with Hughes were interested only in using the Newburyport catastrophe as a lesson to guide in the Company's future policy. And that meeting was important in factory mutual history. To it Hughes brought the first written statement of factory mutual standards of mill construction and fire protection, thus far brought to light. That statement will be found in the Appendix; confused and unorganized as it is, in form and wording, it is still valuable as a definite record of the principles upon which Hughes had carried on his fire insurance underwriting—an underwriting, as proven by his whole record, well in advance of the general (and largely "judgmatical") fire insurance underwriting of the time.

The point in the directors' minds about the Newburyport loss seems to have been the wood construction of the Essex mill and small storehouse. Hughes' statement that no other mill of wood had been burned, said also by inference that the

Company's losses thus far had occurred in brick or stone buildings. But the directors were not satisfied with that reasoning, and rightly. Wood construction for mills was a thing of the past; those that were left were either actually unsafe, or too few in number to give any average for insurance. The directors put their feelings concretely:

“VOTED, That all Policies on Factories built of Wood be discontinued as they expire and that no further risks on such properties be taken except by a vote of the board of directors.”

There was no panic in that vote; no frightened rushing from one policy to another—if there had been, the directors would have ordered Hughes to cancel at once all existing policies on wooden mills. Once more those men gave proof of sound poise.

Oddly enough, it was William Dwight, the youngest director present, who brought out another illustration of that steady refusal to stampede. Dwight, more impulsive and impatient than the rest, offered a motion “That risks on Wooden Store Houses be not taken hereafter except by a vote of the board of directors.” And the Company's ancient minute book thus records the action on Dwight's motion:

“This vote was not passed but after discussion the Treasurer (Hughes) was advised to avoid, as far as was consistent with the interest of the Company, all insurance on such Properties, and under no circumstances to insure Wooden Store Houses except for a very limited amount and at a large additional premium.”

In short, Hughes was thus left with full responsibility for the Company's underwriting. The directors would advise him; they would not limit his freedom of action and decision. Particularly they would not make him run to them on every question. Such breadth is not found in small men.

/ / / /

Less than four months later, on July 1, 1856, a wind of tornado proportions swept over Massachusetts. At Nashua, New Hampshire, while not so violent, it was still almost a gale. In the brick cotton mill, six stories high, of the Nashua Manufacturing Company, the operatives had opened the windows to let the big wind sweep through to cool off the rooms during the dinner period. The operatives were still at dinner when fire broke out in the spinning room. An old report runs:

“It is stated by the young man who first saw the fire, that it appeared to proceed from a basket of clean waste, and that while he hastened to get a bucket of water to extinguish it, the fire spread with great rapidity owing to the high wind and the windows being open.”

In little over an hour the big mill with its 11,000 new spindles was destroyed—and the Boston Manufacturers Mutual had had its third total loss in the first six months of 1856. Again there was no question of moral hazard. The loss was \$200,000, the insurance was \$115,000 divided among nine companies. There were two policies of \$5,000 each, three policies of \$10,000, three of \$15,000—and the Boston Manufacturers Mutual for \$30,000. The mill had been considered first-class in its fire equipment and care. There was no criticism of Hughes' underwriting.

That series of four total losses in the twelve months from July, 1855, made the Company recognized as the boldest fire underwriter in its field. Including the Nashua fire it had incurred more than \$100,000 in losses in twelve months, of which \$70,000 had come in the first six months of 1856. That \$70,000 was double the cash premiums in the same period—and was to prove slightly more than the cash premiums for the whole of the year.

Thus the final test of the directors. On January 31, 1857, John L. Hughes asked for a special meeting, and presented a statement of the Company's affairs. Following the Nashua fire the losses had been light, less than \$3,000 from August 1st to December 31st. But the twelve months total for 1856 (of more than \$72,500) could not quite be met from the year's cash premium income. Specifically, Hughes asked if the "deficiency" of \$2,886.03, should not be met by an assessment upon the Company's members. It was another excellent opportunity for small-visioned panic to show itself. But the directors met the situation with this laconic entry in the old minute book:

"VOTED, That in consequence of the trifling amount of said deficiency, it is not now expedient to supply the same by laying an assessment."

That, as it proved, was the only time in 100 years that the Boston Manufacturers Mutual was ever faced with the possibility of an assessment. And the steady-nerved ability of those directors of 1856 and 1857 laid the foundation, and preserved the integrity, of the Company's magnificent operating record.

So the sharp test of adversity in that year of 1856 was met. And met well. But Hughes, strength sapped by sickness, was no longer equal either physically or nervously to the demands of the growing business. With innate honesty he realized his inability and on February 11, 1857, resigned as secretary and treasurer of the Company. The directors' appreciation of the man was fittingly shown by their voting him an extra year's salary "in consideration of the faithful and successful labors of Mr. Hughes in building up said Company, and conducting its business hitherto." There was justice in recognizing Hughes' work as successful. Even with the bad year of 1856, after illness had impaired him, his six-year record was remarkable. In those six years he had written (and

risked) a total of \$32,839,900 in insurance, against which there had been losses of \$152,586—or about 46¢ on each \$100. Of the \$323,000 paid in cash premium deposits, a total of \$153,000 had been returned to the members as not needed. Despite the year 1856, the members had still cut their net insurance cost by 60 per cent over anything they had known before the Company's organization in 1850.

Thus passed from the Company's service its first underwriting executive, John L. Hughes. He had brought the Company into active operation, had built its foundations—and built well. In his place came Edward E. Manton, friend and associate of Hughes in both textiles and factory mutual underwriting. Eight years younger than Hughes, physically strong, and very able, Manton was to lead the Company through a great war, and through the severest period of business depression this country had yet seen.

With Edward E. Manton, the Boston Manufacturers Mutual entered upon its second great period of growth.



CHAPTER ELEVEN

In the City Exchange

THE Boston directory dated July, 1856, shows the Company's new office to have been located in the City Exchange Building, a brown freestone business block newly erected at what is now 60 to 68 Devonshire Street. But in 1856 Devonshire ended at State, and the City Exchange (as the building was commonly known) was then numbered from 10 to 14 Devonshire. The directory also shows that the Company occupied room 31. In room 50, John Aiken had his office as treasurer of the Cocheco and Salmon Falls mills. In room 58, was William Amory and his Amoskeag and Stark mills of Manchester; in room 62, his cousin James S. Amory handled the affairs of the Nashua and Jackson companies. Thus in four rooms of the same building the Boston Manufacturers Mutual, its president, and the two men making up its executive committee, were all conveniently located together.

Once more the Company's headquarters were on historic ground. For the City Exchange stood on the site of the old Exchange Coffee House that had been torn down in 1854. It was a site that had been a popular meeting place for State Street's men of affairs during almost fifty years. The first Exchange Coffee House, built by Bulfinch in 1804, had been a great towering structure that was a town pride until it burned down in 1818. Rebuilt in 1822, on less elaborate lines but with something of the look of a London inn, the Exchange Coffee House was the scene of a great dinner given the Marquis de Lafayette on his visit to Boston in August, 1824. William



THE EXCHANGE COFFEE HOUSE

As it looked in 1848

Amory was present at that dinner, and the following year (as a lieutenant in the crack Boston Light Infantry) he was part of Lafayette's military escort at the laying of the cornerstone of the Bunker Hill monument. That ceremony was held on June 17, 1825. It marked the 50th anniversary of the battle of Bunker Hill, and William Amory—just two days past his twenty-first birthday—not only heard Lafayette greet the surviving comrades of the American Revolution, but he also heard the magnificent oration then delivered by Daniel Webster. From the admiration there born, came much of William Amory's long and warm friendship with Daniel Webster.

The old Exchange Coffee House had held the first business newsroom established by Topliff for the Boston merchants. On

stormy days its snug warmth had drawn the men "on 'Change" from the unsheltered State Street sidewalk. It had been a favorite haunt of Nathaniel Hawthorne's, when he worked in the Boston Custom House around 1840. When torn down in 1854 the old place left behind many memories of pleasant meetings, of business ventures there planned; of jovial dinners to which Boston men sat down at two in the afternoon and did not rise until eight or nine o'clock in the evening. The old Exchange Coffee House would have been mildly amused at the notion that a "three-hours-for-lunch" club is a modern invention.

At the beginning of March, 1857, in Room 31 of the City Exchange, Edward Eddy Manton was solemnly sworn in as the Company's new secretary and treasurer. His middle name came from his grandmother's family; there were Eddys who were prominent Quakers, though Edward Eddy Manton was a member of the Episcopal church and not of the Society of Friends. But even so, like his predecessor Hughes, Edward Eddy Manton "had conscientious scruples against taking any oath," and the swearing in at City Exchange was done under the solemn and sincere affirmation often called "the Quaker oath." Two weeks earlier, Manton had receipted for the Company's books and liquid assets which had been audited by William Amory and found in order. Those assets, incidentally, amounted to about \$48,000 of which \$43,000 was in demand notes—interest-bearing loans to various member mills. About \$4,600 was in cash on deposit in bank, while a third item of \$120.61 represented office cash "on hand in Trunk." Small figures, in the light of later growth, but of decided interest when viewed against the fact that when Edward E. Manton left office twenty years later, aged and fatally ill, he turned over to his successor liquid assets seven times larger than those he received in 1857.

The Mantons were an old Rhode Island family, the first Edward Manton having been a contemporary and neighbor of Roger Williams. In about the seventh generation, Edward Eddy Manton was born in 1804 (the same year as William Amory) in the village of Johnston, R. I. His father, the Honorable Edward Manton, died in 1820 when Edward E. was only 16. He was the youngest of nine children and the Rhode Island records show that the boy was promptly placed under guardianship ("as a minor under the age of 21"), probably to protect his interest in his father's estate. But the fact that his guardian's sureties were bound in the sum of only \$6,000 would indicate that Manton's inheritance was not large.

His life during the next eleven years is still a blank. When Manton again can be traced he was 27, and senior partner in the firm of Manton and Kelley operating a cotton mill of 800 spindles driven by the power of the Woonsocket River. Three-quarters of a mile away was the mill of Zachariah Allen. The Manton and Kelley mill in 1831 was turning out 5,500 yards of "print cloth" each week and was of sufficient prominence to give its name to the locality. The old stone mill stood for almost 60 years and was then torn down and replaced by the Manton mills of the American Woolen Company. That section of Providence is still known as Manton—named, it is said, from the mill built by Edward E. Manton before he was 27 years old.

His uncle, Colonel Jeremiah Manton, was a noted early textile manufacturer of Rhode Island, but with characteristic independence Edward E. Manton seems never to have been part of his uncle's textile activities. Of more importance was Manton's marriage about 1835 to Mary G. Nightingale, which linked him to another prominent textile family. At the time of his marriage Manton was 31; his wife was 21 and her brother, George C. Nightingale, was 23. Between Edward E. Manton



EDWARD E. MANTON

President, 1865-1877

Secretary, 1857-1865

Treasurer, 1857-1877

"One of the most capable underwriters that ever lived."

Tribute of a New York competitor

and his brother-in-law there is evidence of a strong friendship similar to that between William Amory and William H. Prescott. In the case of Manton and George C. Nightingale that friendship was reinforced by common business interests. When Zachariah Allen formed his second factory mutual company in 1848, both Edward E. Manton and George C. Nightingale were members of the original board of directors. Moreover an uncle, Samuel Nightingale, had helped Zachariah Allen form the first factory mutual company in 1835, had served as its first inspector and in 1836 had become its president. When John L. Hughes left Providence in August, 1850, to put the Boston Manufacturers Mutual into operation, he was succeeded by Edward E. Manton as secretary and treasurer of the second factory mutual company. And Manton entered upon his new duties with the advantage of his brother-in-law as a fellow-member of the board, and his wife's uncle as president of the parent Providence company. Through that last connection particularly, Manton could draw freely upon the accumulated experience of Samuel Nightingale's fourteen years in factory mutual underwriting.

But Edward E. Manton was no mere follower or family protégé. That Samuel Nightingale's experience was of initial value to him cannot be doubted, but Nightingale died in 1851 and thereafter Manton was on his own. He displayed such ability that in November, 1855, he was made president of his company and immediately showed his strong individualism by moving the company to quarters of its own, separate for the first time from those of the parent company. And when in February, 1857, he resigned to come to the Boston Manufacturers Mutual, his Providence company though thirteen years the junior was already writing a volume of insurance twenty-four per cent greater than that of the parent company.

The move to Boston was a move to greater opportunity,



THE CITY EXCHANGE BUILDING, BUILT IN 1854

The Company's office was in this building
from 1856 to 1869

greater responsibility, and greater financial return. The highest salary recorded for the earlier companies until 1865 was only \$1,200 but Manton came to the Boston Manufacturers Mutual in 1857 at a salary of \$4,000 and was raised to \$5,000 in 1861—very good money for that day when the pay-dollar and the take-home dollar were the same. For that salary Manton assumed responsibility for an annual insurance volume greater than the combined volume of the two earlier companies, and more than twice as large as any volume he had previously written himself. Had he been a timid man, or less able, his adjustment to that larger scale of operations might have been painful, prolonged and costly. But Edward E. Manton was not a timid man.

On the contrary, the ancient policy books of the Boston Manufacturers Mutual give interesting glimpses of a firm and sure mind at work. Settling down in the office in City Exchange, his first care was to study the Company's existing risks and lines of insurance. The sick and failing Hughes had lost touch with the physical situation of various risks—as the disastrous Essex Steam Mill loss had shown. Manton, reviewing his predecessor's underwriting, got the immediate policy renewals out of the way and then began a systematic checking of each risk and policy. He was not a desk-tied executive. Vigorous in mind and body, Manton travelled that year more than 10,000 miles—by train, by stagecoach, by horse-and-buggy—through five New England states, and New York. At least half of his time was spent on the road, and from each trip he came back to the office in City Exchange to jot down crisp and laconic pencil notes in the policy book.

Always the comment was decisive. After inspecting a brick woolen mill in a Vermont village, insured at a rate of \$1.75, Manton came back to the office to write: "Renew at $1\frac{3}{4}$, or with a watch all year $1\frac{1}{4}$." His brother-in-law, George C. Nightingale, had been active in developing textile mills in Connecticut and had insured them with the Boston Manufacturers Mutual since 1850. His stone cotton mill at Putnam, Connecticut, had been insured for \$18,000 at a rate of \$1.12½. Manton, inspecting it in 1857, found it so well kept that he jotted on the policy: "Renew at 1%." That this was not mere brotherly love is shown by another note on the policy of a brick cotton mill at Norwich on which the Company had a line of \$16,000 at the same rate of \$1.12½. Manton's pencil note reads eloquently: "Renew at 9/10 (90¢). \$25,000 if wanted."

Those notes, in Manton's characteristic handwriting, give vivid proof of a keen and discriminating intelligence. The brick cotton mill of the Exeter Manufacturing Company in New

Hampshire had been insured for \$33,000 at a rate of 1%. Manton looked it over, and jotted his decision: "Renew at same, if an additional force pump is added. If not, renew for \$10,000 at 1¼%." On the policy of a mill at Whitestown, N. Y., insured for \$17,240 at 1¼%, he wrote: "Renew \$10,000 only, at 1½%—if Picker remains as now." On policy after policy he wrote the one grim word: "Drop." Once he varied his note by making it doubly emphatic: "Drop—discontinue," as if to indicate some special urgency in his dissatisfaction with the risk. And once he incorporated in the policy itself the following interesting and unusual wording:

"This policy made with the special agreement that whenever the Secretary of this Company shall be dissatisfied with the order of the establishment he shall have the privilege of cancelling this Policy."

On January 1st, 1857, the Boston Manufacturers Mutual had had insurance in force of more than \$6,500,000. Manton began his work about March 1st, that year, and in the remaining ten months dropped or cancelled policies totaling \$960,000—about one-seventh of the insurance in force in January. That sharp pruning was timely. As the year wore on, the economic situation of the country showed signs of strain. A comet blazed in the sky of early June; for two weeks wild storms swept across the country and New England newspapers gravely discussed the possibility that the comet had caused the storms. There was tension in the air. The Supreme Court had rendered its Dred Scott decision that decided an Illinois lawyer, Abraham Lincoln, on the course of action that in four years was to make him President. Kansas was "bleeding" with partisan warfare; the newspaper accounts of outrage and murder were nervous reading. In July the commercial failures began. They swelled in August, they doubled in September—and the mills and factories began to close. A young mill treasurer in Boston,

Edward Atkinson, wrote to a friend on September 21st that "call money is at 18 per cent, and hard to get at that." A week later he was writing to reconsider his earlier refusal of a position outside the textile industry. "The wear upon my health is such," he wrote, "that I shall feel it my duty as soon as possible to take up some business not involving such intense care and anxiety."

In October the failures were greater than those of August and September put together. The great Pacific Mills at Lawrence were forced to suspend when the banks of Boston and New York stopped specie payment. The Bay State mills in Lawrence went into receivership, and the stock with a par of \$1,000 sold for \$350 per share in October—and for \$40 in late November. By the middle of December the banks had resumed specie payment and the worst of the crisis was over. But that panic of 1857, short and severe, jolted the textile industry of New England into new patterns—many mills were on the bargain counter during the next two years.

By February of 1858 the young mill treasurer, Edward Atkinson, had forgotten his decision to leave the textile field and was buying an interest in a New York cotton mill. Oddly enough, in arranging for insurance on the mill he wrote as follows: "Have removed the picker from No. 1 mill and made other changes at the suggestion of Mr. Manton, which improve the risk materially." In November of that same year, Atkinson was interested in another panic-born bargain—the Indian Orchard mills—and again his correspondence reveals the advice and counsel of Edward E. Manton. But neither man then knew (or dreamed) that two decades later, Atkinson would be taking over from Manton (twenty-three years the senior) the management of the Boston Manufacturers Mutual.

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OFFICE OF THE
 Boston Manuf. Mutual Fire Ins. Co.
 CITY EXCHANGE BUILDING.

100 Devonshire St.

Boston.

Dec 29th 1859

Miss P. Whitin Low

Genl

Fluorwith is policy
 No 2388 for \$50.000. on your Stone Mill
 and Machine shop - Cash paid \$525 -

premium Note for signature -

This policy is sent with the understanding
 that an additional amount of water
 shall be provided for the picker sprinkler
 and the pumps of the two Mills shall
 be connected by iron pipe with upright
 pipe in porch of Stone Mill with hydrant
 at each story - as soon as convenient -

Respyrly yrs -

E. E. Manton Secy.

Holograph Letter of Edward E. Manton, 1859

That background of bankruptcy, tight money, and depreciated values, is essential in appraising the results Manton achieved. In such times both moral and physical hazards increase. If a hard-pressed owner is not actually tempted to convert, by means of a fire, his insurance into cash, he is led just as dangerously to put off needed improvements, to neglect repairs, to skimp on personnel and equipment. As he went from mill to mill on his inspection travels, Manton was alert for the signs that spelled danger to the trained eye. On the moral hazard he checked his findings with the judgment and knowledge of William Amory and the other directors; the

physical hazard he decided for himself. In his quietly firm way he fought against any lowering of standards in fire protection; on the contrary he worked constantly not merely to maintain but to raise them. And he had intuitively grasped the great principle that Edward Atkinson, years later, was to put into these words:

“The only persons who can prevent loss by fire are the owners and occupants of the insured premises. Upon them rests the responsibility for heavy loss when any occurs.”

The best physical means of fire protection can be nullified by a management or ownership indifferent, neglectful, unconvinced or uncooperative. That Edward E. Manton knew this, is well shown by a letter surviving from those early days. To a cotton mill owner he wrote:

“Experience of every year confirms to us the necessity of better protection, or fire apparatus for cotton mills, than you now have—particularly in the picker, as there (is) now nothing to wet the ceiling, or but a small part of the room. The tubs supplying the sprinkler (are) very small, and but partially full. No pipe in porch or rear of mill to reach the upper stories. These reasons are given as an excuse for our declining to renew the policy with the apparatus as it now is.

Not wishing you to make any change in this respect, if you are now satisfied with your present arrangements

Respy

E. E. Manton, Secy.”

The last sentence of that letter is very revealing. He made no attempt to force change, however desirable, upon an unconvinced or unwilling owner. And his method worked. As a second letter shows, the owner in this case gladly took Manton’s advice and improved his risk—just as Edward Atkinson had done also with his New York mill.

How many losses Manton avoided by dropping or cancelling policies in that first year, cannot now be ascertained. But the record of that terrible panic year of 1857 shows only three small losses in the first eight months—for a total of \$622! Then, on August 1st, Manton renewed the policy of the Newmarket Manufacturing Company on their three stone cotton mills at Newmarket, N. H. The mills had been insured with the Boston Manufacturers Mutual for several years; while the buildings were old, they were well-kept and the fire protective equipment was adequate by the standards of the time. And the policy specifically barred any loss on the hazardous pickers.

The new policy, however, was not a month old when on August 28th it was endorsed by Manton as follows:

“Liberty is given to draw the water out of the Mill Pond for three weeks to repair the dam; it is understood that all the mills will be stopped during this time.”

In a mill driven by waterpower that meant that the big water wheels would be stopped and the force pumps inoperative. The only water available in case of fire would be that stored in the roof tanks and in the fire buckets on each floor. But a constant watch service was maintained, and with the machinery idle there would be no friction of moving parts, no accumulation of inflammable waste. In other words, to use the phrase that military men made sadly current in World War II in explaining the Battle of the Bulge, Manton was taking on the Newmarket mills a “calculated risk” for just three weeks. And before the twenty-one days were half gone, fire had struck.

At three o'clock on a September morning a watchman made his regular rounds in Mill #2 and found nothing wrong. But half an hour later flames were seen licking from the windows of an upper floor; before daybreak the mill of 6,000 spindles was

a total loss. There was insurance of \$44,000 on Mill #2, of which the Boston Manufacturers Mutual carried \$20,000 and three other insurance companies had policies of \$8,000 each. The actual loss, however, was placed at \$100,000 and the mill owners were thus heavy losers over and above the insurance: there was no trace of moral hazard. When the directors of the Boston Manufacturers Mutual assembled to consider the loss there were present William Amory, William Dwight, John Aiken, James Read, and James S. Amory—but not even the impulsive Dwight made any criticism of Manton's underwriting, so well had the man's judgment and ability already impressed them. Rather, their sole concern was with the payment of the \$20,000. The loss had occurred in the very month in which Edward Atkinson had reported money "at 18 per cent, and hard to get at that."

But the directors raised the money; the loss was paid in full, and promptly. And characteristically the Boston Manufacturers Mutual emerged the stronger for the experience. Up to this time it had been the Company's habit to invest its reserve cash in demand notes—loans to member mills at six per cent interest. But the panic conditions of 1857 revealed the inherent weakness of such loans in times of commercial stress, when business paper depreciated sharply. And the main result of the Newmarket loss was the directors' sound decision to call in such loans and thereafter to invest only in negotiable securities, principally bank stocks which were the "blue chips" of that day.

No further losses came that year. At the annual meeting in January, 1858, Manton could report for the year 1857 a total in cash premiums of \$62,838 against losses of \$20,622. At the next annual meeting, in January, 1859, he reported premiums again in excess of \$60,000 and losses of only \$3,715 in the entire twelve months—though financial pressure was still heavy on

mill managements. And at the end of his first five years, Manton could report a total of \$37,560,000 in insurance written . . . against losses of only \$71,479. Or just 19¢ in loss on each \$100 of insurance risk taken.

In that same five years, covering a great panic and the opening of a great war, the lowest rate charged for cotton mill insurance by the general insurance companies was \$1.25 per \$100. But in that period, Manton had collected a total of \$350,743 in cash premium deposits . . . and of that total had returned to the policyholders the sum of \$232,155 as not needed for losses and expenses of operation. The Boston Manufacturers Mutual had thus protected its members through those five years at a net cost of 31.5 cents for each \$100 of insurance—the lowest figure of cost the mills of New England had yet known in any comparable period.

Those were remarkable figures for the time. They are remarkable even today, when considered as the work of just one man assisted by a single clerk. The typewriter had not been invented; all records, policies, and letters, were written by hand. There was no telephone in existence, to bridge distances. The Company's risks were scattered mainly over six States, and in cities, towns, and small villages reached by series of branch railroad lines with frequent change of trains at junction points, and then by rural stage or hired livery team over rutted country roads. In 1859, when Manton was 55, the Company's records show that he spent 143 days that year in travel—and covered 14,233 miles. Younger men today, faced by such conditions, would falter and groan in protest. For that travel meant more than miles; there was also the sheer physical labor of inspection. The mills were long; they were high—four, five, and six stories, with basements. There were few elevators. From basement to attic Manton climbed steep stairs, and walked each long floor . . . and repeated the effort in

each separate building of the mill yard.

Not only was Edward E. Manton able, very able. He was also gifted with a steady driving energy that was truly prodigious.



OLD TIME COTTON MILL

Once inspected by Manton, it still stands
at Newmarket, New Hampshire

CHAPTER TWELVE

War and Postwar

THE first shot on Fort Sumter in April 1861, the historic meeting of Generals Grant and Lee at Appomattox in April 1865—these were the events that began and ended four years of war. With the exception of the American Revolution, it was the longest and most soul-searching struggle this nation has ever known. It was also marked by the heaviest, most deadly, fighting ever to occur on American soil. And as the English historian and biographer, John Morley, later declared, it was the only war in modern times that “no skill or patience of diplomacy could have avoided.”

At the second battle of Bull Run the only son of Daniel Webster was killed—he had been a member of the Temple Club in 1850. On the battlefield of Gettysburg the grandson of the midnight rider, Paul Revere, was killed; in that grandson’s tent William Amory had slept during a visit to the front on the eve of an earlier battle. Amory’s own son served with the Second Massachusetts Cavalry and in a fight with Mosby’s guerrillas was taken prisoner. After months of suspense and deep anxiety he reached home again, with health shattered by the rigors of prison camps. William Dwight lost a gallant son at the battle of Antietam; a year later he lost a second son, shot down by bushwhackers in Louisiana. Edward E. Manton had no sons but lost a nephew in the Union effort. James Read also lacked sons but as the casualty lists lengthened he, like his fellows, knew personal involvement, personal anxiety, personal sorrow, as pain and death struck in every close Boston

circle. In those four trying years the men of the Boston Manufacturers Mutual, all beyond military age, felt nevertheless the cutting impact of war.

But the old records and policy books of that period show, oddly, little effect of the war upon the Company itself. For war was then largely a matter of men and armies rather than as today a gigantic struggle between the industrial efficiency and output of nations. A revealing background glimpse of the times comes from the letterbooks of Edward Atkinson who was then treasurer of the Indian Orchard mills near Springfield, and assistant treasurer of the Bates and Androscoggin mills at Lewiston. In July 1862, shortly after the deadly Seven Days' Battle before Richmond, Atkinson wrote to a friend:

"Business is very perplexing. Cotton 42 cts (from a normal of 9). It keeps ahead of cloth (prices) and we are much puzzled to keep moving. By the use of Surats (India cotton) I have kept all my mills in full operation when 80 per cent of all others have stopped."

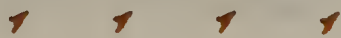
In September of that same year, during Lee's invasion of Maryland (and three days before the battle of Antietam), Atkinson wrote again: "Still very busy, spinning cotton at 50 cts . . ."

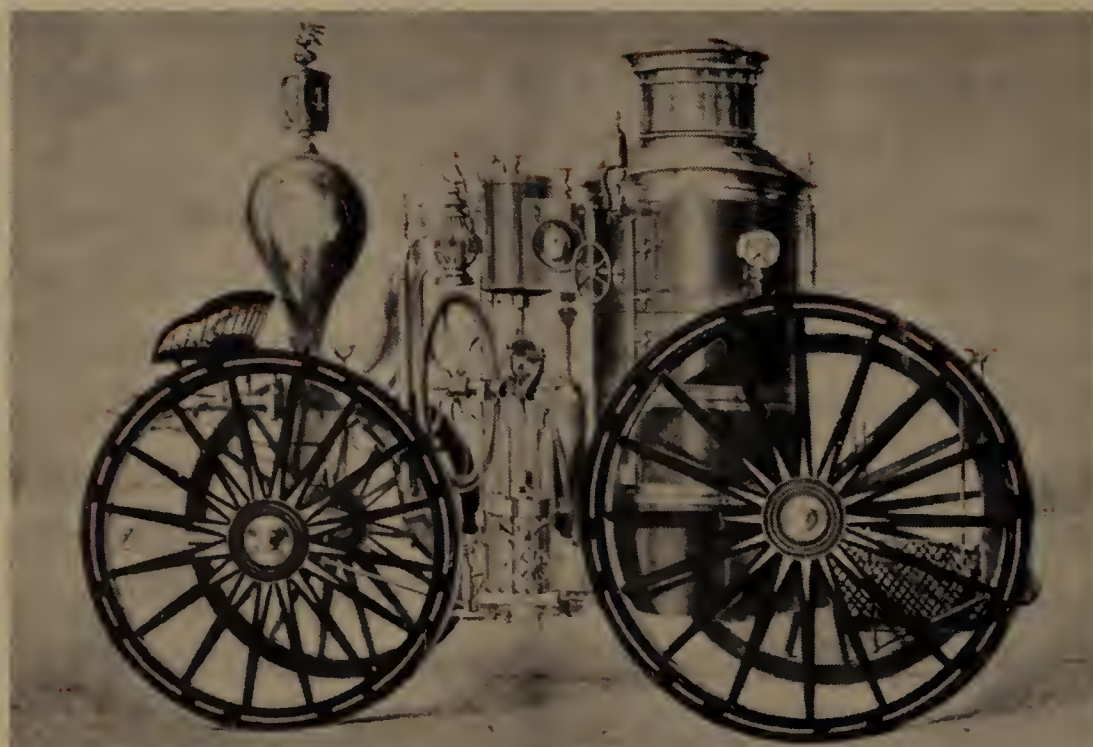
He next made an elaborate report for the Boston Board of Trade in which he estimated that in July of 1862 there were in the North only 1,200,000 cotton spindles in operation—out of a total of 4,745,000 spindles in place. He further estimated that the consumption of cotton had fallen to 426 bales per day, against a total capacity of 2,666 bales per day. Commenting on those figures the New York *Evening Post* of May 14, 1863, quoted Atkinson as also saying:

"The large decrease in the operations of the cotton mills has not caused distress among the operatives; enlistments

in the army and the demand for mechanics in government workshops having given employment to men, while the activity of the manufactures of woolen goods, shoes and clothing has occupied the women.”

The Boston Manufacturers Mutual did not then insure clothing factories or shoe factories, but a study of its policies confirms the growth in woolen manufacture mentioned by Atkinson. The number of policies issued by the Company on cotton mills rose from 197 in 1858 to 258 in 1862, and to 277 in 1864. But the percentage (to all policies issued in each year) dropped from 79 per cent in 1858 to 71 per cent in 1864. Woolen mills accounted for 20 policies in 1858, 33 in 1862, and 57 in 1864—and the percentage rose from 8 per cent in 1858 to almost 15 per cent in 1864. The next largest class was machine and metalworking shops, on which there were 9 policies in 1858—and only 13 in 1864. As for firearms, the Company issued one policy on a gun factory in 1858, two in 1862, and three in 1864. This was the last great war in the country's history to be fought primarily by men, with relatively little help from machines. The New England Business Directory of 1865 lists a total of 746 manufacturing establishments of all kinds—of which just 22 (less than 3 per cent) had been engaged in the manufacture of firearms, ammunition, and military accouterments. William Dwight's Pepperell mills made tent cloth, shirtings for soldiers, sheets for the Sanitary Commission—the forerunner of the American Red Cross. William Amory's Amoskeag plant turned out 125 Springfield rifles a day, but had to depend also on the manufacture of its famous Amoskeag steam fire engine and the newly invented McKay sole-sewing machine that was to revolutionize the shoe industry. Neither the Boston Manufacturers Mutual nor its member mills avoided war work; it was simply not available.





COURTESY OF WILLIAM AMORY, ESQ.

A steam fire engine, made by
the Amoskeag Company

With three out of four of New England's cotton mills closed, the year 1862 was perhaps the most remarkable single year in the Company's long history. Five small losses, two of them in December, made up the loss record—showing that the insured mills, though idle, had not relaxed their care. At the year's end Edward E. Manton was able to report the smallest total of losses ever known . . . just \$738 for the twelve months, or less than one cent for each one hundred dollars of insurance risk taken. Both in amount and ratio that loss record of 1862 has not been matched by any other year in the Company's full century. For that time, or any time, Manton's showing was thus genuinely remarkable.

The year 1862 was also noteworthy as the last year that Manton worked alone. Wartime conditions had begun to make travel more difficult. A document that has survived among the papers of Edward Atkinson is proof that as early as August

of 1862 no citizen of Massachusetts of military age could visit, for example, the nearby State of Maine without some form of passport. In Atkinson's case, in order to visit the mills at Lewiston of which he was assistant treasurer, he first had to secure from the secretary of the Commonwealth the certificate reproduced herewith—as guarantee that his travel was not “to evade in any manner, military duty.” That particular rigor of war has not since been known in New England.

Along with this increase in travel difficulties was the growth of the business that already had increased 50 per cent in just five years under Manton's management. Accordingly the directors met on October 17, 1862 and the record of that meeting, as set down by Manton himself (as secretary of the Company), runs quaintly as follows:

“After consultation it was unanimously agreed that it is requisite to have a suitable person to assist the Sec'y in visiting the property, mills etc., insured in this office. Mr. James Read proposed that Wm. B. Whiting be employed for that purpose. . . . After some conversation it was voted that James Read and the Sec'y (Manton) be appointed to engage Mr. Wm. B. Whiting.”

Once more James Read had done the Company a great service. He had founded the Company, he had secured John L. Hughes to put it into successful operation, and he had now brought to the attention of the directors a man who was to supplement admirably the special abilities of Manton. William B. Whiting's quiet devotion to duty, his faithful energy, matched Manton's own. For the next fifteen years, eventful years, the story of the Boston Manufacturers Mutual is the record of the harmonious working together of Manton and Whiting, a well-matched powerful team.

William B. Whiting had been born in the village of Wrentham, Massachusetts, in 1817; his forbears in this country dated

Commonwealth of Massachusetts.

Secretary's Department,

Boston, Aug. 19, 1862.

Authority is hereby given to
Edward Atkinson,

a Citizen of Brookline, to
visit the State of Maine,

on private business, he having made oath
that in making said visit, he does not intend to evade in any
manner, Military duty.

Witness the Seal of said Commonwealth, hereunto affixed, the

By authority of / date above written.
His Excellency /
the Governor

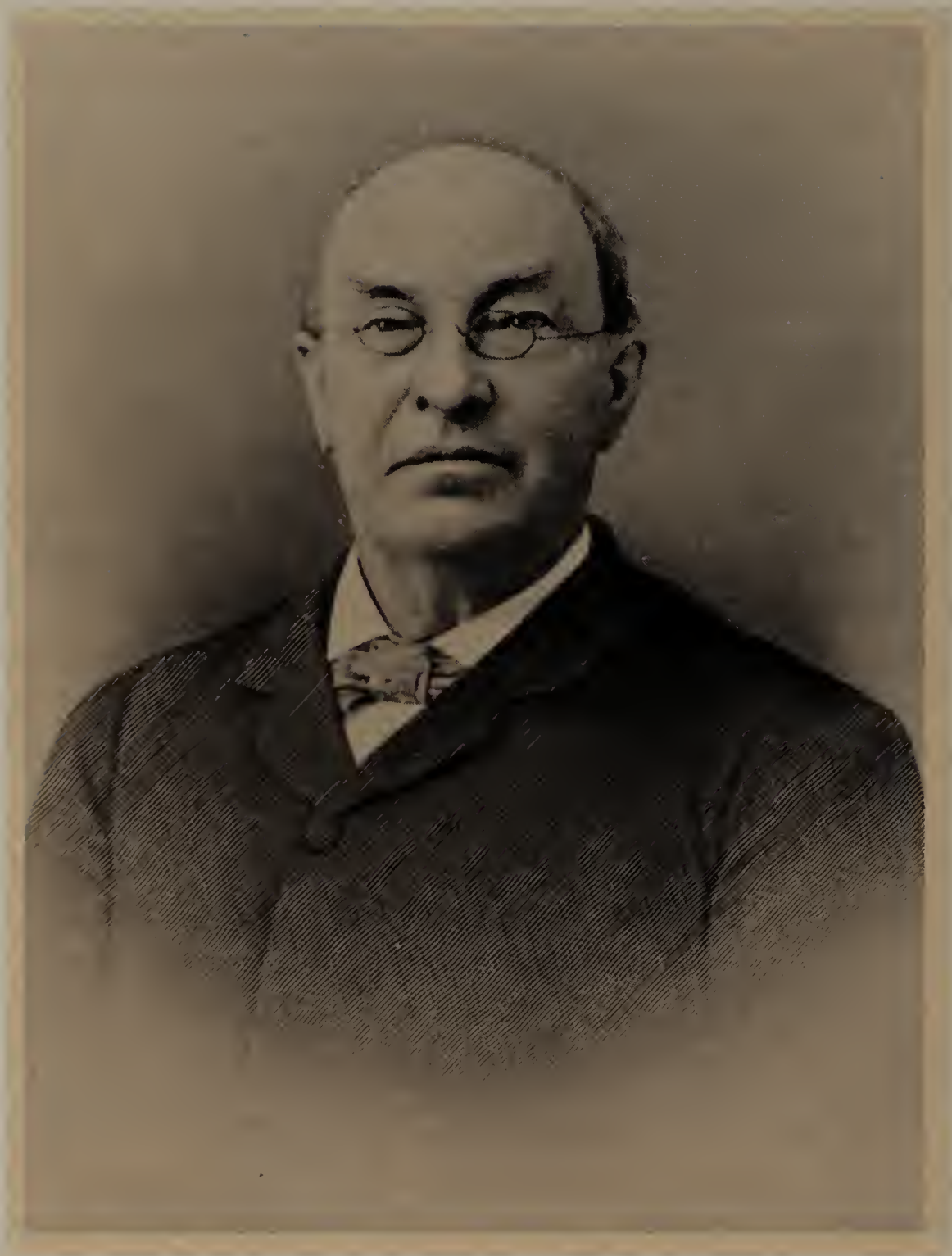
C. T. West
Secretary of the Commonwealth

TRAVEL PERMIT, 1862
Revealing the unusual restriction placed
upon travel by the State of Massachusetts
during the Civil War

back to 1630. His early history is obscure but tradition indicates that his education was merely that of "the little red school-house," that he early went to work, and gradually climbed as a self-made man. It is definitely known that in 1854, at the age of 37, he became Agent of the old cotton mills at Sturbridge, Massachusetts,—having worked himself up from bobbin boy to machinist, to master mechanic, to Agent . . . a considerable rise in those days. When the Sturbridge mills failed in the great panic of 1857, Whiting went to Newburyport as Agent of the Globe Steam Mills and there became known to James Read who was a director and selling agent for those mills.

At Sturbridge, Whiting had had a thorough mechanical training in mills driven by water power. At Newburyport he could study the newer development of steam power, as there applied to industry by Charles T. James—the pioneer steam mill builder who by 1856 had successfully proven that steam could be used for cotton manufacturing as economically as water . . . and in some ways more reliably.* Whiting was naturally studious and inquiring; his mechanical bent had been strengthened and disciplined by long years of practical observation of machinery in action. There is evidence that in his five years as Agent at Newburyport he became interested in adapting the steam pump to the needs of fire protection, and perhaps thus drew the attention of James Read. When he began his

*James was a remarkable combination of self-taught engineer, builder, and promoter. A carpenter's apprentice who developed such a mastery of practical mechanics that at 31 he was given a Master of Arts degree by Brown University, James was early drawn to steam power. Known as the "great prophet of steam-driven cotton factories," he was especially successful in the textile development of seaport towns—where coal could be brought in cheaply by coasting vessels. Beginning in 1839 he built and started 6 mills at Newburyport and before 1852 (when he was 47) had been responsible for starting some 23 mills with a total of 300,000 spindles. Sixteen of those mills were in New England; among them were the famous Naumkeag mills in Salem.



WILLIAM B. WHITING

Vice-President, 1875-1894

Secretary, 1865-1894

*"Few men have done more service to the
textile industry of New England"*



work for the Boston Manufacturers Mutual he was probably the first man of such all-round practical training to enter the factory mutual insurance field. At the age of 45 he had found his life's work.

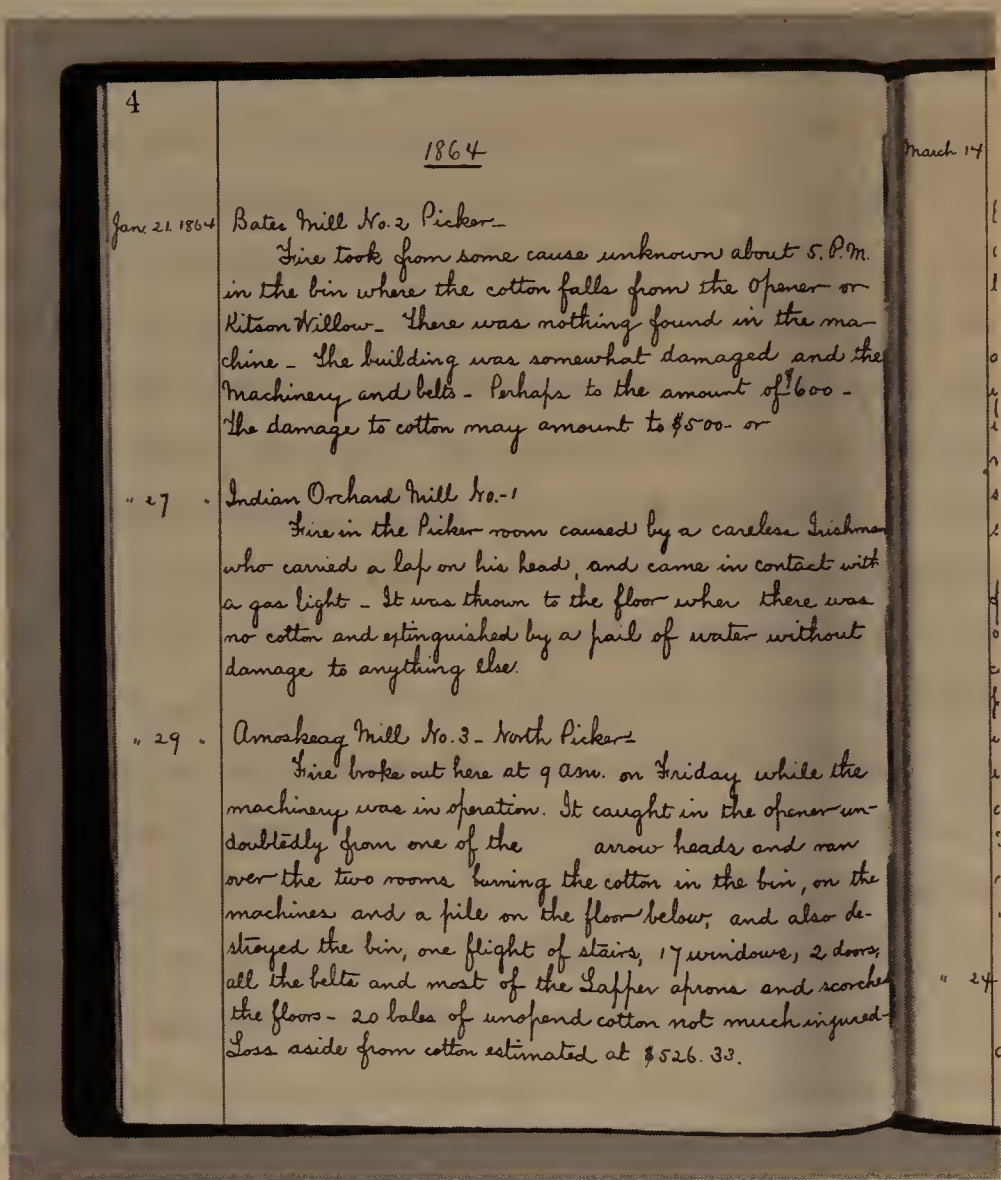
Whiting began his new duties at the end of October, 1862, and in the next two months travelled 3,000 miles on his inspection tours. He kept his home in Newburyport, however, not moving nearer Boston until 1867 although it is evident from the old records that he was frequently in the City Exchange office. In November of 1863, a year after joining the Boston Manufacturers Mutual, Whiting was also made inspector for the senior factory mutual insurance company of Providence. The probabilities are that his inspections were further shared by other Providence companies, thus placing upon a definite basis the informal exchange of information that had been practiced by Edward E. Manton and to some degree by John L. Hughes. With Hughes and Manton this had grown out of their intimate relationship with factory mutual circles in Providence. But with Whiting, who had no Providence connections, it attained the firmer footing of an accepted business practice.

Under Manton's wise encouragement William B. Whiting took his own time and way in his early inspections. In 1863, his first full year with the Company, Whiting put in 111 days on the road against Manton's 93—but Manton covered 8,000 miles (an average of 86 miles per day) against Whiting's total of only 6,500 miles (an average of 59 miles per day). By 1864, however, Whiting had found his stride—covering 11,192 miles in 153 days, for the excellent average of 73 miles per day. The relief to Manton is obvious from the fact that in that same year (1864) he had to be on the road only 60 days, and was thus left free for the steadily growing problems of the Company's underwriting. In 1865 Whiting's average rose to 84 miles per day,

and by 1867 he was responsible for two-thirds of the 25,000 miles per year that he and Manton covered in visiting the Company's risks.

The effect on the business was marked. In 1863 the annual volume of insurance written first passed \$10,000,000—a figure no other factory mutual company had even approached. Four years later (1867) the volume had doubled—to pass \$20,000,000. Another two years and the total of insurance written (in 1869) had passed \$25,000,000 per year, while the annual premium income had climbed to \$220,000. All the work of the two men, Manton and Whiting, with the aid of just one clerk.

William Amory, with his shrewd judgment of men, was quick to appreciate the ability of the new team. He also realized that the new scale of operation demanded that the Company's chief executives be full-time professional men—the day of the part-time amateur had passed. At his quiet insistence the annual meeting in January, 1865, was marked by his retirement as president and the unanimous election of Manton to that office, with Whiting as secretary. At the same time the Company's by-laws were revised to raise the number of directors from seven to nine, Manton being elected to one of the new positions on the Board while Edward Atkinson was chosen to fill the other. It is probable that Atkinson's selection was due to James Read, with whom Atkinson had begun his business career 23 years earlier as “a boy of less than sixteen.” As to Manton, it was undoubtedly William Amory who sponsored him, and it is significant that from 1857 to 1865 Amory would allow no change to be made in his nominal salary of \$200 per year (fixed for the presidency in 1851)—although in those same years the salary of Manton, as secretary and treasurer, had risen from \$4,000 to \$6,000 per year. There could be no better proof of Amory's ungrudging admiration of Manton's ability.



THE FRANK RECORD
An early page from William B. Whiting's
record of fires

That generosity of Amory's was matched by Manton's own toward William B. Whiting. The latter had been with the Company barely one month when, in December 1862, he began to keep the Company's first formal record of fires. For 1863 the entries were brief notes of the cause of each fire, but at the beginning of 1864 the record abruptly changed and became a history of each fire from origin to extinguishing—including causes, spread, and the performance of men and equipment in the emergency. That record, handwritten, still survives in the form of a 200-page notebook; with it William B. Whiting

unconsciously laid the foundation for the first published experience table in the history of fire insurance in this country, if not in the world. Where such statistics then existed in the general fire insurance field they were guarded jealously by the individual companies as private trade secrets.

That frank publication by the Boston Manufacturers Mutual of its loss experience began in 1864. It first became detailed and important in 1865 when William B. Whiting was made an officer of the Company. In the annual report, printed in January that year, Manton included Whiting's full notes on the fires of 1864 and generously gave him the credit. Thereafter those notes formed part of Whiting's annual report as secretary, and the innovation drew immediate attention. By January, 1867, Whiting could write: "Our Annual Report of Fires having heretofore been well received by those insuring in this office, we may perhaps regard it as an established thing." Characteristically the man was over-modest. His careful summary of each fire, his pertinent comment on each year's experience, were not only destined to make up the Company's most valuable early record but were also to set the precedent for what later, in Edward Atkinson's hands, was to become almost a trademark of factory mutual insurance—the generous sharing of hard-won experience as a powerful aid in speeding the evolution of industrial safety.

Whiting's fire record for the year 1864 began quietly. During the first six months the losses were low—chiefly picker fires promptly extinguished by perforated pipe sprinklers or other fire protective equipment. Then, at about 9 o'clock on Friday morning, July 8th, fire was discovered in the picker of one of the mills at Salmon Falls, New Hampshire. The second policy issued by the Boston Manufacturers Mutual in 1850 had covered this mill; it had been renewed each year. The fire

equipment included every safeguard then known—perforated pipe sprinklers, powerful rotary pumps, standpipes, hydrants, hose and buckets. The openings from the picker building into the main mill were closed by iron doors. Every known precaution had been observed.

But the things that no equipment could then guard against—the failure of human judgment, the uncertainty of human action in the presence of danger—were woefully evident in Whiting's report on that fire. The Agent of the mill ordered water turned on to start the sprinklers, but an excited workman fumbling at valves was delayed in getting the right one open and the sprinklers in play. The rotary pump was started—but another over-anxious workman shut the safety valve, and the pump was disabled. A second pump was started but the fire had grown so threatening that panicky operatives threw off the power from spindles and looms—with the result that the pump was suddenly speeded up and “the main gear split into fragments.” Burning fiercely in the picker building, the fire unchecked now swept against the iron doors which, as Whiting reported, “the Carder said he saw melt down” *—and the main mill was soon ablaze. A strong wind was blowing, the loss of the whole village was feared—and men turned from the mill to fight desperately for their homes. The village was saved, but the mill of 17,000 spindles was a total loss.

A portion of the newspaper account of that fire makes strangely familiar reading today. After estimating that the mill and its contents had cost more than \$250,000, the newspaper remarked: “To replace at present prices would cost nearly half a million.” Wartime inflation had set in. Cotton that

*Up to this time iron doors had been thought thoroughly safe. From the Salmon Falls fire of 1864 dates William B. Whiting's quiet crusade to have iron doors replaced by the tin-clad wooden doors that are now standard protection.

normally could be bought at 9 cents, and in 1862 had cost Edward Atkinson 50 cents—that cotton in 1864 was bringing \$1.75 per pound. The currency was inflated. On June 30th, 1864, it took \$250 in government “legal tender” to buy \$100 in gold. On July 11th (three days after the Salmon Falls fire) when the Confederate General Jubal A. Early made his daring raid through Maryland and even threatened Washington, gold rose to 285—the highest price of the war. As one historian has noted, the war dollar was then worth less than 40 cents, and the Government in effect was paying 15 per cent on its war-loan issues.

The total insurance on the burned mill was nearly \$200,000. Except for the Boston Manufacturers Mutual, no fire insurance company was involved for more than \$25,000. The Boston’s line was its maximum, and the Company’s loss of \$50,000 was the heaviest single loss yet known in the factory mutual field. But in spite of the amount, the times, and the currency, that loss was met without flinching. Wisely, Edward E. Manton and the directors had been building up reserves against just such a contingency. On August 11th, from those reserves, the Company made a first payment of \$30,000—and sixty days later, on October 11th, the balance of \$20,000 was met in full.

That record of payment is further remarkable because on August 9th a second heavy loss had been incurred—this time in a woolen mill at Smithfield, Rhode Island. Again it was a failure of men and equipment rather than lack of foresight and precaution. At two o’clock on that August morning a watchman making his rounds opened the door of the picker room, and smoke gushed out so thickly that he could not enter. He managed to close the door; gasping and coughing he ran to the main mill to tug at the bell rope and sound the alarm. As he did he saw flames shoot from a window on the third floor of the picker building; the fire already had spread

through blower shafts (known as "trunks") that ran from floor to floor.

The three boilers of the mill were ready, with the steam pressure at 40 pounds, and the mill superintendent (hoping to save water damage) first turned hot steam into the blazing rooms. But the steam had no effect and he thought belatedly of the perforated pipe sprinklers. The passageway in which the valves to the sprinklers were located was by then so smoke-filled that he could not stay long enough to open them—and get water into the perforated pipes. Other men, responding to the bell, had started the mill's three rotary pumps and with hose streams were trying to keep the fire from spreading into the main mill. They found the hose streams strangely feeble and, thinking that a water pipe from pumps to hydrant had burst, they began looking for the leak. In their excitement they wasted almost half an hour during which the fire burst through the picker house roof and leaped into the main mill.

It was one of those "if" fires so maddening to the fire insurance underwriter. *If* the superintendent had first turned on the water to the sprinklers, or *if* it had been promptly known (as was later discovered) that the feeble hose streams were not due to a leaky pipe but rather to the breaking of a coupling on the pump shaft, the fire might have been confined to one floor of the picker house. As it was, the Boston Manufacturers Mutual had a loss of \$30,400—the full amount of the policy. But it was paid without comment or recrimination, in a lump sum on October 5th; the directors did not even meet to discuss the loss. And the following January they showed their complete faith in Manton, not only by making him president but also by asking him to consider the writing of still larger lines of insurance on individual risks. Significantly it was William Dwight, as hard-headed a business man as there was on that Board, who made the motion that the question of increased risk by any one fire

be put solely in Manton's hands for study.

Two months later, on March 17, 1865, came the third heavy loss in the series. Again a loss was due to what scientists have called "the human equation", and the disaster still has interest today as evidence of a totally new hazard coming into American industry. The first oil well had been bored in Pennsylvania in 1859, less than six years before, but already the volatile by-products of petroleum—such as naphtha and benzine—were finding their way into commerce. The loss of March 17th was on a stone cotton mill at Warwick, Rhode Island, and William B. Whiting's story of the fire is pertinent reading:

"The mill was stopped to do repairs on the water wheel and the pump was useless. . . . A five-gallon can of Naphtha, of the kind used for mixing paints, had been received at about 6 P.M. . . . One of the machinists, not being acquainted with the dangerous character of the substance, took the can into the basement of the mill (having an open lamp in his hand) and commenced pouring the contents into the bung-hole of a barrel where they had usually kept it. Having poured most of it in, he discovered that the faucet of the barrel was open and the Naphtha was running out onto the ground. In order to stop the faucet the man set his lamp down on the floor near the barrel, when the vapor took fire instantly . . . burning the man's face and setting on fire the Naphtha on the floor.

"The man called some others to his aid and one of them turned the barrel on end, at which the fire took the vapor at the bung-hole. So rapid was the progress of the fire that they only had time to throw one pail of water—which only scattered the burning fluid onto the woodwork nearby. . . . They soon abandoned all efforts to save the mill. . . . Not a cent's worth of anything was saved."

The loss of the Boston Manufacturers Mutual was \$40,000, the full amount of its policy. In the nine months from July, 1864 to March, 1865, the Company had lost in just three fires

a total of \$120,400, the greatest loss yet experienced by any factory mutual company. That series of fires is notable because it called from Edward E. Manton the first formal statement of underwriting policy. Referring to the directors' suggestion in January (that the maximum line of insurance be increased) he reported that the Company then had 40 different risks insured for a maximum of \$50,000 each, and 33 risks on each of which the loss by one fire might reach \$40,000. In view of the three heavy losses that had occurred, he advised against any increase beyond \$60,000 in the amount subject to one fire loss. The Company's annual premium income was just reaching \$120,000 and Manton's next comment reveals the basis of his reasoning. Said Manton to the directors: "I think . . . it would be safest—and for the best interests of the insured—that the year's receipts of premium should be sufficient to pay at least two losses of the largest amount." On that rough rule of thumb, common practice at the time, Edward E. Manton achieved some remarkable underwriting results.

Just how remarkable they were may be shown by a comparison. In February, 1867, the National Board of Fire Underwriters held its annual meeting and in a review of postwar conditions made the following points:

1. That the national fire loss from 1860 to 1864 had averaged \$18,000,000 per year.
2. With the coming of peace, the fire loss had jumped to \$43,000,000 for the year 1865.
3. That the national fire loss was still increasing, and for the first six months of 1866 had exceeded the entire loss of 1865.

Those points represent the combined experience of the general fire insurance companies who made up the membership of the National Board of Fire Underwriters.

By comparison, where the national loss experience for 1865 had been 138 per cent greater than the 1860-1864 average—Manton's loss record for the Boston Manufacturers Mutual was only 38 per cent greater than his 1860-1864 average. And where the national loss experience for 1866 doubled the record set by 1865—Manton's loss record for 1866 was actually 37 per cent *less* than his 1865 figures.

The argument might be advanced that 1866 was merely a lucky year for Edward E. Manton. But again the comparison exists to show his skill in underwriting over a longer period. In April, 1869, the National Board of Fire Underwriters met once more. This time they reviewed the national loss experience for the nine years from 1860 to 1868 inclusive. The point was made that the years 1863, 1864 and 1865 were "years of inflation and advancing prices" and were "succeeded (in 1866, 1867 and 1868) by a period of contraction and falling markets" that brought to the fire insurance underwriter "more serious complications than the darkest days of the war."

Special statistics were part of that review, and were printed in the *New England Insurance Gazette* of April, 1869. They show that in the nine years the general fire insurance companies had suffered losses amounting to 46 cents on each \$100 of insurance written. By contrast, in the same period, the Boston Manufacturers Mutual under Manton's skilled handling had incurred losses of only 26 cents—while insuring exclusively a class of risks that the general companies regarded, and treated, as extra-hazardous.

In those nine years of war and postwar conditions, Edward E. Manton had risked (in insurance written) a total of more than \$125,000,000. The losses in those same years had been \$330,000—or, as noted, about 26 cents on each \$100 of risk taken. The cash premiums in those years had totalled \$1,087,000, of which \$594,000 had been refunded to the Company's

COTTON MILLS

Rate of premium.....	125 cents.
Additional premium for deficiencies:	
Roof of wood.....	Twenty-five cents.
Floors not laid in mortar, nor of plank	Ten cents.
Building of wood, floors not laid in mortar	Fifty cents.
No scuttle or ladders.....	Ten cents.
Picker in mill, in fire-proof room ...	Twenty-five cents.
Picker in mill, <i>not</i> in fire-proof room	Fifty cents.
No force pump	Twenty-five cents.
No casks of water in each story....	Twenty-five cents.
No watch, or watch <i>without</i> a watch-clock	Twenty-five cents.
No lightning rod	Ten cents.
Machine shop in mill, with forge....	Twenty-five cents.
Machine shop in mill, with forge, and wood worked	Fifty cents.
Warmed with hard coal.....	Ten cents.
Warmed with wood or bituminous coal, (stove pipes to be cleaned once in two months,)	Twenty-five cents.

Lighted with open lights, or waste not removed daily, *not insurable*.

☞ Add for external exposure as per Table, Chapter 9.

☞ For general detail, see Company's printed Survey and Application for Cotton Mills.

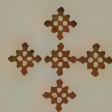
NOTE: In adjusting the rate on cotton mills, it must be recollected that there are few, if any, *strictly first class standard* cotton mills in the West or South-West, or in fact in the country, and that to the minimum rate for such mills must be added the additional premiums as per above Table, *for all deficiencies*.

If driven by steam power, or if there is a steam boiler for any purpose in the mill, an additional premium should be charged, from... 50 to 100 cents.

AN OLD-TIME RATE SCHEDULE

The rates charged on cotton mills by general fire insurance companies in the 1860s. Reprinted verbatim from the handbook, *The Practice of Fire Underwriting*, by Arthur C. Ducat, Hartford, 1865

policyholders as not needed by losses and expenses of operation . . . making the net cost of the Company's insurance to its policyholders during that hazardous period only 38 cents on each \$100. As shown by a surviving rate book of 1865, issued by a member of the National Board of Fire Underwriters, the lowest rate charged in that period by the general fire insurance companies for cotton mill insurance was \$1.25 per \$100. And there were no refunds to policyholders from that rate.



CHAPTER THIRTEEN

An Era Passes

By 1869 the Company had outgrown its office in the City Exchange and in July of that year moved to a new building on Summer Street near the junction with Bedford. The site was the famous Church Green where earlier had stood for 54 years the graceful New South Church designed by Bulfinch in 1814. All this section of Boston was changing. Until the late 1850s it had been mainly residential. Daniel Webster had had his Boston home on Summer Street; nearby had been the homes of Cabots, Lodges, Grays, Jacksons, Gardners. Ralph Waldo Emerson was born in the neighborhood, and part of his childhood was spent on Summer Street.

But about 1858 the fine old dwellings began to be encroached on by business. In the 1860s the Tontine Crescent was torn down, the New South Church was demolished, stately homes disappeared. In place of Crescent, Church, and homes, rose what were then proudly described as “elegant palaces of trade”—towering structures of brick and granite topped most often with the mansard roofs that became fashionable in the 1860s, though derived and named from a French architect who had flourished in Paris two centuries earlier. It was these roofs that made the occasion for the one revealing personal anecdote of Edward E. Manton that has survived.

To the Company’s office in the Summer Street building there came one day a young insurance man to discuss a policy with Manton. Business finished, the young man was encouraged to



COURTESY OF THE BOSTONIAN SOCIETY

Franklin Street in 1870, showing the business blocks with mansard roofs that replaced the Tontine Crescent

linger a little; the two stood by the office window while they talked. Across the street workmen were in view as they climbed about the roof structure of another new building. They caught Manton's eye and he made a remark that the young man later recalled and remembered to his dying day. For in that Summer Street office, in 1871, Manton had said in his quiet way: "Those mansard roofs will burn Boston some day."

Behind that remark may have been the odd prescience so often shown by the gifted fire insurance underwriter—a quality that at times seems almost a sixth sense. Certainly it is a curious coincidence that in December of 1871 Manton again moved the Company's office—this time to the Rialto Building at the corner of Devonshire Street and Milk. And when, less than a year later, in November, 1872, the great Boston con-

flagration started at the corner of Summer and Kingston Streets (in the same block in which the Company's Summer Street office had stood)—a conflagration that raged all Saturday night, most of Sunday, and destroyed 70 acres of business Boston—the flames were stopped directly opposite the Rialto Building . . . and the office of the Boston Manufacturers Mutual was untouched.

The keen judgment, the real flair for insurance underwriting, that mark the work of Manton stand out more clearly when the background of the times is reviewed. In 1865 he had set the maximum sum to be risked in any one fire at \$60,000—or one-half of the annual premium income. Had he been a man ridden by rules, he would have raised that limit to \$80,000 in 1867 when the premium income passed \$176,000. Actually, as if sensing what was to come, he did not raise it to \$80,000 until 1870 when the premium income had passed \$235,000—and was roughly three times the amount of maximum possible loss in any one fire. Nor did he stop there. When his great work ended at the close of 1877 his maximum loss limit was still \$80,000—against a premium income that had risen to \$357,000, and was more than four times larger.

It was well that he took such precautions. The year 1869 brought the first check to the postwar boom when on September 24th came the famous "Black Friday" of Wall Street, and gold fell from 162 to 135 in one wild trading session of the stock market. To quote the historian, James Ford Rhodes: "The legitimate business of the country had been paralyzed. Importers of foreign goods and sellers of American produce had been at the mercy of the gold gamblers. The wild speculation on the Gold Board and the Stock Exchange was followed by many defalcations." Two years later the great fire in Chicago, with its loss of nearly two hundred millions of dollars,

had a strange effect on business nerves. That fire began on Sunday, October 8th, and *The Nation*, of New York, remarked that "at the close of business on Monday (October 9th) a gloomy atmosphere, an undefined sense of dread and terror, overhung the entire financial community and the ablest, calmest, most conservative, did not hesitate to express their fear that the catastrophe of Chicago will prove but the beginning of widespread financial and commercial difficulty." As if to emphasize that prophecy came the Boston fire of November, 1872, with a loss of seventy-three millions of dollars and the failure or forced reorganization of 30 out of the 32 general fire insurance companies chartered in Massachusetts. James Ford Rhodes was himself then a business man and it was from personal memories that he later wrote: "The two fires in Chicago and Boston were the largest ever known in this country and had a profound effect on business thought as introducing a new element of risk." And the next year, 1873, saw a financial panic that was followed by a five-year depression more severe than anything this country had known—or was to know until 1933.

The year 1873 was also a landmark in the history of the Boston Manufacturers Mutual. The two previous years had been very good, with losses of less than 17 cents on each \$100 of insurance. Then on the night of April 14th, 1873, a workman was alone in a room of the great Chicopee mills near Springfield, Massachusetts. For about two hours, and by the light of a whale oil lantern, he had been working over the gears of the big water wheel; to leave his hands free he had perched the lantern on a convenient part of the machinery. In some way he knocked against the lantern; it fell into the casing that housed the gear-shafting; the casing was packed with lubricant, a mixture of oil and tallow which began to burn. The workman seized a bucket of water and threw it on the flames



COURTESY OF THE BOSTONIAN SOCIETY

THE DEADLY ROOF OF 1872

The mansard-roofed building in which the great
Boston Fire of 1872 began



—but this merely spattered and spread them. He then ran for help; by the time it arrived the fire had climbed the great drive-belt (“probably by the lint that had stuck to the belt leather”) into the rooms above. The flames grew so fast that the workman and his arriving mates could not reach the fire pump. There were perforated pipe sprinklers but either in excitement or ignorance no one thought to turn them on: in a matter of minutes the great mill was ablaze, the fire out of control.

Worse was to follow. The heat was so intense that the men could not stay between the burning mill and a warehouse that stood 130 feet away. The wind drove sparks and burning embers against the warehouse; the fire took hold on wooden door and roof; a thousand bales of cotton were destroyed. The mill had every fire protective device then known; it had been insured in the Company for years and repeatedly inspected by Manton and Whiting. It and the warehouse had been so well separated that each was considered a separate risk, not subject to the same fire. And thus the Boston Manufacturers Mutual, in the complete destruction of both buildings, lost its maximum of \$80,000 on the mill and \$43,000 more on the warehouse and cotton. A net total of \$123,000 through the sheer bad luck of a lantern falling.

It was by far the greatest single net loss yet experienced by any fire insurance company (barring a city conflagration), and the largest the Boston Manufacturers Mutual was to know in the next eighteen years. But it was met promptly, the directors did not hold even one meeting to consider it, and its chief importance in the Company’s history is that from that fire dated a new effort to guard against the human failure so evident in William B. Whiting’s terse summary: “Careless use of lantern by a repair hand. Former agent lately dead. New manager not being familiar with the fire apparatus it was



The Chicopee Mill before the fire of 1873



The Chicopee Mill after the fire, the result
of a lantern falling

broken at an early period of the fire.” From that Chicopee fire of 1873 dated Manton’s and Whiting’s insistence on a trained fire brigade in each mill—an insistence that brought such noticeable results as later to lead Edward Atkinson to declare that the Chicopee disaster marked the close of an era in the Company’s history, and the beginning of a new advance in loss preventive measures.

That constant profiting by experience runs all through the Manton and Whiting record. Between the two men there had grown up a quiet division of labor, based on the evident respect of each for the other's special ability. In Manton's charge were all questions of underwriting, of policy coverage, of the placing of lines of insurance, of major loss adjustments. His profound knowledge of mill values made him a recognized authority, as shown for example by a special meeting of the directors held (in June, 1871) to consider "the question of proper basis of valuation for insurance of a good cotton mill." In the Company's old minute book that meeting is thus reported:

"The general tenor of the discussion was that it would be better to leave all such matters, as heretofore, to the discretion of the President (Manton) and no motion calling for a vote was made in reference to this subject."

Five years later the directors again showed their confidence, in another meeting which ended on this note concerning a new hazard in industry:

"After a discussion upon the question of insuring risks working India Rubber, and using Naphtha . . . the directors declined to advise by vote the President as to whether he should accept such risks—that leaving the entire responsibility upon the officers of the Company."

Manton was president and treasurer. In 1875 William B. Whiting was made vice-president as well as secretary, and to him fell the responsibility of inspecting risks, of minor loss adjustments, of the constant study of causes of all fires. In 1871 he had been given an assistant inspector; in 1875 another was added, and in January of 1877 a third practical man was taken on as an inspector of pumps and general fire apparatus—the need of specialization was thus early recognized. Under Whiting's competent supervision—so well done as later to win

him praise for "rare executive ability"—the mileage travelled in inspections grew steadily. In 1870 Manton and Whiting together covered 26,000 miles. In 1872, with a third man in the field, the mileage was 41,000 and in 1876 the addition of another man swelled the total to 62,914 miles of travel in that one year. Incidentally, it is of interest today that the statistics so carefully given in the old annual reports show the cost of that travel as never exceeding 5¢ per mile . . . including meals and lodging!

It was Whiting who instructed the inspectors and evaluated their reports. It was on Whiting's sound judgment in things mechanical that Manton based his own decisions in the remarkable underwriting that marked the Company's growth. The two men worked easily together; the fact of teamwork was never ignored. The point is underscored by two pencil notes in an old policy book, which significantly avoid the first person singular. Those notes, in Manton's handwriting, run briefly: "Renew (policy) if fire apparatus is improved. (They) decline improving apparatus and we decline renewing." That eloquent "we" stood for Manton and Whiting at work, in steady confidence and mutual understanding. It was a superb team.

But after fifteen years together that team was to be broken. In 1877 Whiting was 60 and Manton 73. As events later proved, Manton was then suffering from incurable disease but he still (in the words of a final tribute) "gave without stint his thought and time and toil, long after bodily infirmities had pleaded for entire release." His boldly successful underwriting had begun to change the insurance attitude toward cotton mills. In 1850 the general fire insurance companies had been careful to avoid such risks. Fifteen years later the general fire underwriters of Boston were glad to follow Manton's judgment and to share in some degree the risks he recommended. There is striking proof of that change, in a remarkable policy endorsement of

1865 made by Manton. Following the end of the war a pent-up civilian demand had made itself felt and cotton mill operation was speeded up in an effort to cut costs and increase production. Under the pressure some mill managers began to run their machinery around the clock. It was a condition that had not been met before.

One of the great hazards of a cotton mill then lay in the possibility of overheated bearings in the long lines of shafting that ran through each mill. The longer the machinery was run, the greater was that hazard; operation day and night, without stopping, obviously raised that hazard immeasurably. Since all mills did not run night and day this new feature of risk was regarded as "not mutual"—something not met in the majority of the mills and therefore a risk unfair for the Company to assume for the benefit of a few. It was an impasse that Manton met with characteristic boldness and ingenuity—by an endorsement that first appears on a policy issued to a mill in Lewiston, Maine, in the amount of \$47,500 on building and contents. That endorsement, believed unique in fire insurance history, was dated July 10, 1865 and was worded as follows:

"Permission is hereby given to operate the Machinery of the Lewiston Mills . . . all night and day—it being mutually agreed that other Policies shall be procured to take the risk of the night, and that this Policy shall attach and be liable only to pay any loss arising from any fire commencing between 5½ o'clock A.M. and 6½ o'clock P.M."

It is known that "the other Policies" mentioned in that and other similar endorsements were actually secured by Manton, and were policies in general (not mutual) fire insurance companies. The episode not only reveals Manton's individual way of working out a problem; it is also significant of the standing he had attained in general fire insurance circles.

Manton's success with the Boston Manufacturers Mutual

Boston July 10th 1865. Permission is hereby given to operate the Machinery of the Luister Mills, insured by the within Policy - all night and day - it being mutually agreed that either Policy shall be procured to take the risk of the night and that this Policy shall attach and be liable only to pay any loss arising from any fire commencing between 5 1/2 o'clock A.M. and 6 1/2 o'clock P.M.

E E Manton Pres.

UNUSUAL POLICY ENDORSEMENT, 1865

Reproduced from the letterpress copy in
an old policy book

had led, as well, to a remarkable growth in the factory mutual system. When he first came to Boston in 1857 he was handicapped by a sheer lack of factory mutual insurance. There were then just six companies, three quite recently formed, and to care for the insurance lines demanded by the growing values of the mills he was forced to enlist the support of the general fire insurance companies. And mill treasurers and general fire underwriters both, quickly came to respect and to depend on his judgment and ability.

Showing the way by bold (but thoroughly justified) underwriting, Manton by 1864 was handling such lines that a newspaper editor, commenting on the destruction of the Salmon Falls mill and noting its insurance of \$200,000, was moved to remark: "The insurance is large for ordinary times." It was large because Manton had steadily encouraged the growth of the other factory mutual companies: by placing with them all

the insurance they could absorb, and by encouraging them to write heavier amounts. In the case of the Salmon Falls fire the insurance was about 80 per cent of the mill's cost, and of the total of \$200,000 no less than \$175,000 was carried in factory mutual companies—with the Boston Manufacturers Mutual heading the list with the largest line . . . \$50,000. Four years later, Manton's success was so apparent that the factory mutual system began an advance that from 1868 to 1875 inclusive, resulted in the formation of ten new factory mutual companies.

The system of insurance that in 1850 had only three companies, by 1875 (a quarter of a century later) could show a total of 17 companies—and a line-carrying capacity that had grown from about \$70,000 to around a half million dollars. And so prominent was Manton in this advance, so marked his ability, leadership, and influence, that in general fire insurance circles the factory mutual companies were commonly known as "the Manton Mutuals." It was, significantly, a general (not merely a mutual) fire insurance underwriter who publicly termed Manton "one of the ablest underwriters that ever lived."

Thus Edward E. Manton in 1877, nearing the age of 73, began what proved to be his last year. The first ten months were relatively free from loss—only one as large as \$12,000, and the ten months' total only \$44,000. Then early in November came a \$45,000 loss on a paper mill. Ten days later, on November 17th, disaster struck again and under circumstances that rocked the factory mutual world. The Border City Mill in Fall River, Massachusetts, had been built in 1872 and was thus quite new. It contained every fire protective feature then considered of value—mill construction, flat factory roof, perforated pipe sprinklers, standpipes, hydrants, buckets, roof



THE BORDER CITY MILLS IN 1876

Mill No. 1, in left background, was completely destroyed
by a mule-boy's match in 1877

tanks, and two large steam pumps reinforced by a city water supply. Yet in spite of that array, a little mule-boy lighting a gas-jet at 5:30 A.M. of a Saturday morning and (in fright at an unexpected flare of the flame) dropping in panic his lighted match on loose cotton—such a mischance was the cause of a fire that in an hour and a half destroyed the great mill of 35,000 spindles. William B. Whiting tersely summed up that fire in these words: “No head. No discipline. Water all shut off by a gate in a city main that should have been open.”

That fire was the direct cause of a revolution in factory mutual methods that will be later described. It is also noteworthy as the first great fire in which all the loss fell upon the factory mutual companies. The total insurance amounted to

\$430,000 divided among twelve factory mutual companies, with the Boston Manufacturers Mutual heading the list with a policy of \$80,000 on which it sustained a loss of more than \$75,000. That loss was heavy—but the Chicopee loss of 1873 had been heavier. What was so disturbing was the discovery, made by James B. Francis of Lowell who had been called in to study the fire, that in spite of all local inspection it had been possible for a vital connection in the water supply to go unchecked and untested . . . and that consequently the connection had most probably never been open since the mill was built five years before.

Not quite a month later, on December 15, 1877, Edward E. Manton met with the directors for the last time. It was a special meeting, called to consider the adjustment of the Border City Mill loss, and it was evident that the disaster had shocked him deeply. The loss record for the year, even with this fresh addition, was still not bad—about 40 cents on each \$100 of insurance, less than the national insurance loss average and a far from dangerous showing. But it is significant that where normally Manton would have taken charge of that adjustment, he made no attempt to do so this time. Age and sickness had at last sapped his resilience. There may also have been the realization that his days were nearing an end, and that with him an era was passing—that a goal had been reached. Whatever the reason it is certainly of interest that as early as 1865, when the Company had first passed \$12,000,000 in its annual insurance volume, Manton had told the directors of his thought for a \$40,000,000 volume. Now, twelve years later, the year 1877 was closing with a new high of almost \$42,000,000 of insurance written in the twelve months. He was too tired and ill to plan further.

On December 27th Edward E. Manton formally resigned, and Edward Atkinson was elected treasurer to succeed him.

The following month, at the annual meeting held on January 21, 1878, Atkinson was further chosen as the Company's fourth president. That meeting was marked by unusual feeling. Manton's presence, familiar through twenty years, was sadly missed. Of the group of directors who had greeted him on his advent in 1857 not one remained on the Board. John Aiken had retired in 1864, dying some three years later. In June of 1865 Francis Skinner had died and the textile offices and showrooms of Boston were closed to permit the trade's attendance at his funeral services held in historic King's Chapel. On December 24, 1870, James Read had died at the age of 81, cheerful, kindly, respected and venerated to the last. A month later, in January, 1871, William Dwight had retired, followed in 1872 by William Amory. That had left of the original Board only James S. Amory—and he too had retired in January of 1877, at the age of 69.

But James S. Amory returned once more, to attend that annual meeting of the Company's members in January of 1878. And it was he who presented (and who probably had drawn) the handwritten resolution which read:

"Whereas Mr. E. E. Manton has withdrawn himself from the service of this Company after a connection of more than twenty years; first as Treasurer and Secretary, and afterwards as President and Treasurer; during which period the outstanding Policies have increased from \$6,150,472 to \$41,792,000—and during the time of his official relation the business has been successfully managed and the annual return of the premiums paid has averaged for the whole 27 business years of the existence of the Company 66-2/3%, making the cost of Insurance 1/3rd of one per cent, and

"Whereas much credit is properly due to his watchful care and constant improvements in the provisions for safety at the Mills:

"Therefore Resolved, That we, the representatives of the several Mills holding Policies, desire to express our appre-

ciation of the untiring devotion and watchfulness of Mr. Manton over the Property committed to his charge during the period of his connection with this Institution; and regret that the condition of his health demands rest from continued labor; also

“Resolved, that in acknowledgment of his valuable past services we request the Board of Directors to vote him an annual payment during the remainder of his life, of such sum as they may think sufficient to secure his comfort.”

The words of that resolution honored a man who had but little facility of expression; he was a doer, not a talker. They came, moreover, from a man whose Boston reserve was more than usually evident; a man who also used words sparingly—and therefore gave them deeper meaning. The father of James S. Amory had married the daughter of Governor James Sullivan of Massachusetts, and the son bore the Governor's name as part of his own. For himself, James Sullivan Amory had married the granddaughter of the American painter, John Singleton Copley; she was also niece to Lord Lyndhurst, the Boston-born Lord Chancellor of England. But in spite of such family connections James Sullivan Amory, while no recluse, never cared for social contact as did his cousin William. A Boston newspaper was later to describe him as “an active and capable business man (who) while agreeable in disposition, in manners was one who preserved a more than ordinary judicious reticence.” A charter associate of the Boston Manufacturers Mutual, a member of the original board of directors, and a member of the Company's executive committee for 27 years—from such a man the quiet words of that resolution in appreciation of Edward E. Manton, carried more than usual weight and meaning.

And thus the assembled members of the Company took them—voting Manton unanimously “an annual payment during the remainder of his life of such sum as the directors may think

Whereas, Mr. E. E. Manton has withdrawn himself from the service of this Company, after a connection of more than twenty years; first, as Treasurer and Secretary, and afterwards as President and Treasurer; during which period the outstanding Policies have increased from \$6,150,472. to \$41,792,000. and during the time of his official relation the business has been successfully managed, and the annual return of the premiums paid has averaged for the whole ^{business} 27 years ~~business~~ of the existence of the Company 66 $\frac{2}{3}$ %, making the cost of Insurance ~~1/3 of~~ one per cent, and
 Whereas, much credit is properly due to his watchful care and constant improvements in the provisions for safety at the Mills;

Therefore, Resolved, That we, the representatives of the several Mills Holding Policies, desire to express our appreciation of the untiring devotion and watchfulness of Mr. Manton over the Property committed to his charge, during the period of his connection with this Institution; and regret that the condition of his health demands rest from continued labor; also—

Resolved, that in acknowledgment of his valuable past services, we request the Board of Directors to vote to him an annual payment during the remainder of his life of such sum as they may think sufficient to secure his comfort.

Original draft of resolutions on the
 resignation of Edward E. Manton, December, 1877

sufficient to insure his comfort.” No one then knew how briefly numbered were Manton’s days. His home was at 117 Boylston Street, opposite the Arlington Street Church, where he had moved in 1863 when the section was newly developed as result of the filling in of Back Bay. There on February 1st, 1878, barely ten days after James S. Amory had been moved to such unwonted expression, Edward E. Manton drew his last breath. He had, quite literally, died in harness.

1 1 1 1

So passed one of the great figures of factory mutual history. Reviewing his record, recalling the limited personnel, the slowly evolving equipment, with which he worked, it is clear that no other man in the factory mutual ranks could have done so much—with so little. The Boston Manufacturers Mutual, and the entire factory mutual system, were fortunate in that Edward E. Manton was the man he was, had the rare gifts he had, and came to his work at the time he did. He was perfectly fitted to his time and place and opportunity.

He left behind him a Company 579 per cent larger in volume, 702 per cent greater in assets, than the one he had taken over in 1857. And in that period of a little over twenty years, marked by a great war and two great depressions, Manton had written (and risked) a total insurance of more than \$456,000,000 on what were then the heaviest values and the most hazardous manufactures in American industry. On that volume of almost half a billion dollars there had been losses of only \$990,000—just a little over 21 cents on each \$100 of insurance. It was a truly remarkable achievement in fire insurance underwriting, for the time.

Those figures explain why the supreme tribute to Edward E. Manton came from a source completely outside the factory mutual ranks and also outside New England. In 1886, when Manton had been dead eight years, there appeared in the New York *Daily Commercial Bulletin* an article signed by Peter Notman who was then president of the Niagara Fire Insurance Company of New York, and a former president of the New York Board of Fire Underwriters. Notman had behind him more than 45 years of general (not mutual) fire insurance underwriting, and 36 of those years had been spent in New York. Yet Edward E. Manton's work was known to him, and he had been drawn to make a special study of his career. As a result of that study he wrote:

STATEMENT XXXVIII.

WOOLEN MILL.

2288. Resumé of an adjustment of damage upon the WILCOX WOOLEN MILL, at Meriden, Conn., occurring in April, 1870, made by the late E. E. MANTON, then President of Boston Manufacturers' Mutual, and others. Emanating from this source, it may be considered as authority so far as to what constitutes *machinery, tools, fixtures, supplies, furniture, etc.*, as connected with mill risks and losses.

Twenty-four companies were interested in the loss. The total insurance was \$370,000, and the damage was \$89,400, as follows—policies concurrent except one:—

	Insurance.	Damage.
On the three-story and attic main brick building.	\$95,000 00	\$190 00
On the shafting, belting, machines and machinery, gas, water, and steam pipes; tools, fixtures, supplies, tank, safes, mill and office furniture, contained therein.....	130,000 00	910 00
On the stock and material used, manufactured, unmanufactured, and in process contained therein.....	40,000 00	300 00
On the two-story brick dye-house, machine and repair room, picker-room, drying-room, yarn, wool, and sorting room (in rear of main mill)..	30,000 00	26,000 00
On the shafting, belting, machines, machinery, tools, supplies, fixtures, furniture, dye-tubs, gas, water and steam pipes, engines, boilers, pumps, and their connections contained therein	35,000 00	22,000 00
On the stock and material used, manufactured, unmanufactured, and in process contained therein.....	40,000 00	40,000 00
Totals.....	\$370,000 00	\$89,400 00

APPRAISEMENT.

MANTON'S WORK A MODEL

A loss adjustment by Manton, quoted as a model in Griswold's *Fire Underwriter's Textbook* of 1889 and revealing the respect in general insurance circles for his ability and experience.

“In 1857 Mr. Manton was called to Boston to take the presidency of the Boston Manufacturers Mutual Fire Insurance Company, which had been organized in 1850. I do not know enough of Mr. Manton’s history to say what training or what experience, if any, he had to fit him for the prominent place he immediately took in the mutual insurance business. But certain it is if he was not a trained underwriter he was a very apt scholar and developed qualities and produced results which entitled him to the high place which he enjoyed during his lifetime in the esteem and confidence of his fellow-underwriters. . . . In the minds of underwriters from 1860, at least, to 1878—that is, up to his death—Mr. Manton was the embodiment of the Factory Mutual system . . . (and thus) the distinction he enjoys in the profession. His memory is still green among us.”

That tribute, drawn spontaneously from one craftsman by the lifework of another, can stand as epitaph for Edward E. Manton.



CHAPTER FOURTEEN

A Man of Ideas

TO HIS friend James Ford Rhodes, the historian, Edward Atkinson once wrote:

“I used to think myself only an average man in size, height, and weight, at home. But when I made my first visit to England (in 1877) I was rather surprised to find myself a tall and large man by comparison with those whom I passed by in the streets.”

Rhodes adds that at this time Atkinson weighed about 185 pounds and was 5 feet 8½ inches in height—fairly average, as he said, for an American. But other men who knew Atkinson all agree that physically he seemed larger than the actual figures indicate.

There was, undoubtedly, a mental quality involved. In 1876 he had made his first trip to the West and carried with him a letter of introduction from Charles Nordhoff, famous editor of the New York *Evening Post*, which read:

“I want you to know my friend, Edward Atkinson of Boston, who will hand you this. Mr. Atkinson is one of the ablest men in New England; a man of ideas. . . . He will do you all good (to meet).”

Whether on the street, in an office, or on a platform, Edward Atkinson was physically and mentally an impressive figure. When in January of 1878 he first entered, as president, the Rialto Building office of the Boston Manufacturers Mutual, he was within a month of his 51st birthday and had behind him

an unusual Boston background—as well as a career that already had won him recognition as a spokesman for the cotton textile industry and brought him personal contact with two American Presidents, Grant and Lincoln.

A recent address before the American Branch of the Newcomen Society of England profiles the man's background and prior career in modern terms: it will be found reprinted in the Appendix, and should be read in connection with the following chapters in which Atkinson's interesting growth in Factory Mutual work, and his remarkable contributions to that work, will be considered. The word remarkable, when used in speaking of those contributions, is fully justified. It is rare indeed that a man's best qualifications so completely fit the needs of a new field—or so compensate for his utter lack of practical experience in that field.

Atkinson's very success has tended to obscure the difficult problems he faced in replacing Edward E. Manton as president and chief executive of the Boston Manufacturers Mutual. Manton was a gifted underwriter; Atkinson was not—and did not pretend to be. Manton's special ability had built up the Company from a staff consisting of himself and one clerk to a staff of two executives (himself and Whiting), three inspectors, and at least three office clerks. Moreover he had won the Company, and the factory mutual system, such recognition in the insurance field that in 1877 even a general trade organ, *The Insurance Journal*, was rebuking envious critics by writing: "It will not answer to call the Boston's . . . large lines reckless underwriting. A company that can point to twenty-seven years of successful underwriting, during all of which time they . . . have returned over sixty-six per cent of the premiums paid, is beyond criticism." With such facts in mind no man who knows industry or business can fail to realize how

any newcomer, without insurance training or background, would be looked at askance. Edward E. Manton was no easy man to follow.

It was his bent for statistical analysis that gave Atkinson his first chance in the new work. And there also was William B. Whiting. How far Atkinson could have gone without that quietly able, devoted and unselfseeking man to rely upon to keep things moving while the newcomer gained experience, no man can now say . . . certainly it would have taken longer, and have been much harder. Significantly it was Whiting's carefully kept record of fires and causes upon which Atkinson's statistical bent was first exercised. To Manton, who had literally grown up with textiles and the factory mutual system, Whiting's painstaking record was simply a memory jog—interesting enough, yet still quite supplementary to the actual years of experience summed up intuitively in his underwriting. Neither he nor Whiting, both men of long practical training, had felt the need of crystallizing that record into formal statistics. It was Atkinson's opportunity; he promptly grasped it.

A quick study, as actors use the phrase, Atkinson threw all the power of his mind, all his restless energy, into the new project. In less than three weeks, with the ungrudging cooperation of Whiting, the latter's loss record of 15 years was broken down into such main groupings as the location of each fire (its place of origin in the mill) and its specific cause. The resultant table, published on January 21, 1878, covered 408 fires that Whiting had investigated during the years—and revealed that 86 had been caused by "foreign matter in stock" (the cotton picker hazard), 124 came from "friction and spontaneous combustion," while 108 more were listed "unknown" but could also have been caused by friction or oily waste. In short, at least 50 per cent of the fires pointed suspiciously to faulty oils.

One measure of ability is a man's quick perception of opportunity—and his seizing of that opportunity while others remain blind. Edward Atkinson was never the detached and solitary thinker: all his active life had been spent in the hurly-burly of the market place, and in an industry whose constant fluctuations put a premium on alertness and mental agility. From that point of view the oil investigation which Atkinson began as first result of that fire-loss compilation (and which has been sketched in the Newcomen Address reprinted in the Appendix)—that oil investigation was a master stroke.

Petroleum products from the wells of Pennsylvania had been under investigation for more than fifteen years—but merely because of their hazards as illuminants. In investigating the lubricating qualities of the oils then in use, Atkinson had hit upon a phase of particular interest to American industry—an industry in which textile manufacturing was then the predominant branch. Moreover the end result of that investigation—oils which gave better lubrication with less consumption; oils that were safer, and that also were lower in cost—came at a time when in the words of Victor S. Clark, the historian of American manufacturing, our textile treasurers and mill managers were discovering that “profits often represented nothing more than new economies.” Atkinson's quick recognition of that value in the oil investigation made by Professor John M. Ordway, and the equally quick publicity that he gave it through the New England Cotton Manufacturers Association in 1878, were directly responsible for his first real footing in his new line of work. He also gained a receptive audience for the circulars and pamphlets that began to come almost monthly from the office of the Boston Manufacturers Mutual.

There was one other benefit to American industry in that oil investigation, and the other early research projects carried



COURTESY OF THE BOSTONIAN SOCIETY

THE RIALTO BUILDING

Where Edward Atkinson wrote his first circulars and reports.
The Company's office from 1871 to 1884



out by Atkinson through the Massachusetts Institute of Technology. The Institute, the brain-child and lifework of William B. Rogers, had moved into its Boylston Street home in 1866 and graduated its first class in 1868. But ten years later, in 1878, it was still insecure—from causes that an Institute historian has thus recorded:

“The serious financial panic of 1873 . . . began as early as 1875 gravely to affect the number of students and to dry up that main source of the Institute’s revenues, the annual contributions of generous merchants and manufacturers. By 1878 the numbers and income had so far diminished that this year saw the most serious crisis in the history of the Institute. For many months its existence hung in the balance.”

Edward Atkinson was deeply interested in the Institute. He had been friendly with William B. Rogers for years—the two men had served together on various Boston committees during the war, and Atkinson had been active in support of Rogers during the early struggle for the Institute’s establishment. That Atkinson’s turning to the Institute for his first research project came from his own need, is very clear. But also strong was his deep respect for the new practical science that Rogers preached—and the realization that by such paid projects Rogers (who had been drawn from retirement, to head the Institute in this time of crisis) would thereby be helped in his efforts to keep together a staff that the Institute’s historian records as having had to take “a marked reduction of their already meagre salaries.” At least three members of that staff were financially aided by Atkinson’s projects. They were John M. Ordway, professor of industrial chemistry, and practical mill-chemist; Gaetano Lanza, the Boston-born professor of applied mechanics; and Ellen Swallow Richards, the Institute’s first feminine graduate and instructor.

His employment of Mrs. Richards is of special interest. A country girl who graduated from Vassar in 1870, at the age of 28, she had won "special permission" to enter the Institute as a student of chemistry. Graduating in 1873 with the degree of S.B., the first woman so honored, she had married in 1875 Professor Robert H. Richards of the department of mining engineering, and in 1876 she had set up the Institute's "Woman's Laboratory" which later became the department of sanitary chemistry of which she was the first head. So brilliant was her work that the year 1878, when Atkinson employed her, is noted in Institute history as the year in which all remaining barriers to women students were finally removed. It is possible that Atkinson's attention was drawn to her by C. J. H. Woodbury with whose Institute class of 1873 she had graduated. At any rate, the wool cleaning investigation which Atkinson gave her resulted in a new method that was speedily adopted by the wool industry. It makes strange reading today to learn that one of the advantages of her discoveries to industry was the low cost due to the use of "a quality of naphtha called 'gasoline'"—which was then described as "almost a waste product" of petroleum refining. The Automobile Age was still in the future.

Edward Atkinson's quick turning to science was thus not only a direct help to the Massachusetts Institute of Technology but was also of benefit to North American industry in whose great development the Institute's graduates have played such a part. By that turning he also took the first step in what was to be a profound revolution in factory mutual practice—a revolution that was not an overturning but rather the rediscovery of a principle of thought and action that had been implicit from the first but whose gradual evolution had been almost unconscious. As Atkinson himself later said: "I think it

never occurred to the founders of the (factory) mutual system, and I am sure that it had not occurred to myself, that we were engaged in developing an applied science." That science—of loss prevention engineering—was the very thing that Atkinson desperately needed. For its discovery, and growth, was to steadily lessen the importance to the Boston Manufacturers Mutual, and its brother-companies, of the sheer underwriting ability so vital in Edward E. Manton's day.

Before his first year was ended, Atkinson had struck the new note. His primary interest in oil had been for its use in lubrication. But the whale oil that was now being displaced for lubricating purposes was also being displaced in illumination. The first kerosene manufactured for lighting was criticised for its repellent odor and smokiness. To overcome these faults the manufacturer was tempted to mix with it the "lighter products of petroleum"—to give a cleaner and more brilliant flame. "Many of these compounds," said a contemporary report, "are quite as dangerous as gunpowder"—a conclusion that was driven home to Atkinson when the first four samples of "kerosene burning oil" tested for him by Professor Ordway showed only one to be safe. In the circular that Atkinson at once printed and sent to mill treasurers the warning was given to use no kerosene without testing, and none whose flash point was below 125°. And in that same circular, dated November 26, 1878, came this paragraph:

"Up to this date there has been no loss to this office from the use of kerosene oil for burning, but the danger is evidently increasing and must be promptly guarded against if 'we would close the door *before* the horse is stolen'."

That paragraph is important in itself, as the first direct statement of a new advance in factory mutual methods. It is also important as revealing a phase in Atkinson's own self-

education in his work. With him a new fact learned was a fact to be communicated, and the circulars issued in his first two years make today an interesting study in the progress of his education. As it later proved, in educating himself and in sharing what he learned, he was also educating a whole generation to the new hazards that were coming into industry—hazards due to technological advance spurred on by economic necessity that in turn was due to war and severe depression. The United States Patent Office was created in 1790 and in the 70 years until 1860 granted a total of 36,000 patents. But in the next 30 years, from 1860 to 1890, the number of patents rose to 440,000—or from an average of about 500 per year before 1860, to an average of almost 15,000 per year when Atkinson was beginning his work.

Thus his enlisting of the aid of science, as exemplified in the Massachusetts Institute of Technology, was remarkably timed. Not only were new machines, new processes, new chemicals, new dyestuffs, coming into industry—there was also, due to economic pressure, a great increase in factory floor areas and the speed of machinery. As one example, noted by Victor S. Clark in his *History of Manufactures in the United States*, the ring spindles of the New England cotton mills rotated in 1870 at a speed of about 4500 revolutions per minute. But by 1876 some of those same spindles were being driven at 7500 revolutions per minute (and were to reach speeds of almost 20,000 rpm) with the result that the quantity of yarn turned out was increased by one-half while the powerload per spindle was so lightened that sixteen years later, in Manchester, New Hampshire, a single line of shafting in one great mill was driving nearly 33,000 spindles. For the Boston Manufacturers Mutual, the factory mutual system, and North American industry, Edward Atkinson's advent and self-education came none too soon.

CHAPTER FIFTEEN

A System Is Made Clear

THE years 1878 and 1879 were, for Edward Atkinson, years of adjustment—of finding his way in a new field. Before his advent the Boston Manufacturers Mutual had communicated with its members merely by an annual printed report. But in his first two months Atkinson supplemented the annual report by three special circulars—and issued a total of ten during his first year. If evidence were needed that a new mind had come into the factory mutual field, those circulars gave that evidence.

His fourth circular, issued in April, 1878, unconsciously reveals how Atkinson's mind worked in those early days. In February of that year a watchman in the great Pacific Mills at Lawrence discovered one night that fire was smouldering in a pile of dyed goods—the cause was later determined as spontaneous combustion due to chemical action of the dyes with which the cloth had been colored. The loss to the Boston Manufacturers Mutual was not large, merely \$4,000, and aside from its demonstration of a new hazard in drying colored goods the fire drew at first little attention.

But Atkinson learned that in that fire there had been tested two types of fire doors—one the solid iron door on which the mills had long relied; the other a “tinned wooden door” that the Pacific management had installed in 1873 on the recommendation of William B. Whiting. As far back as 1864, when an iron door in the mill at Salmon Falls had melted down in the intense heat, and failed to stop the spread of

fire, Whiting had been working quietly to educate the industry to the weakness of such doors. But his work had been largely man to man—able as he was, farsighted as he was, he lacked facility in print and thus was never able to gain the larger audience, the more immediate effect, that Atkinson's great gift in printed communication was to draw. Particularly, William B. Whiting seems never to have thought to dramatize the lesson of a fire while that fire was fresh in the minds of the industry.

Thus the importance of that circular of April, 1878: it struck while the occurrence was news, and it dramatized the side-by-side performance of the two types of doors in the same fire—a performance in which the tin-clad wooden door had superbly held and the iron door had failed. Not stopping there, Atkinson went on to devise the fusible link that made the tin-clad door automatic in its closing in time of danger, and thus set the standard still prevailing today. Again it was opportunism in the best sense of the word: the quick perception of opportunity by a man of ideas, and the equally quick seizing of that opportunity for progress. Whiting had devised the door; Atkinson made it known—and the standard.

That report on fire doors is further important as the first appearance in the factory mutual field of a new personality. How Atkinson came to employ C. J. H. Woodbury is not known, but the link may have been through the Massachusetts Institute of Technology of which Woodbury was the first graduate to join the Boston Manufacturers Mutual, and the first to enter the factory mutual field. When Atkinson saw his opportunity in the Pacific Mills fire it was to Woodbury that he turned for the careful investigation that made up the bulk of the fire door circular. That investigation also may have been a trial performance—although Woodbury's report is

dated April 9th, 1878, and is signed "Inspector," his employment was not formally authorized by the Company's directors until July. Woodbury had then just passed his 27th birthday.

Born in Lynn, Massachusetts, in 1851, Charles Jephtha Hill Woodbury came of old New England stock and his early schooling and inclination was toward a liberal arts course at Harvard College. But upon graduating from high school in 1869, economic necessity turned him toward the new technical education then being offered—the Institute of Technology had graduated its first class in engineering only the year before. Entering the Institute, Woodbury graduated in 1873 at the age of 22. In the Institute (whose student body was still small) an eighteen-year-old Maine lad, John R. Freeman, completed his freshman year as Woodbury graduated. But neither Woodbury nor Freeman had any prevision of the careers that awaited them in the factory mutual field.

On graduation Woodbury became superintendent of the Annisquam mill at Rockport, on Cape Ann. A two-story mill, built of massive granite, it dated from 1847 and the steam-power pioneering of C. T. James. Thus when Woodbury drew the attention of Atkinson his technical education had been reinforced by five years of practical experience in cotton mill operation. The point is significant. The prejudice against the college man was then strong in industry. The first graduates of the Institute had to be more than passably good to overcome that natural distrust on the part of the self-made, self-taught men who then staffed the mechanical departments of the mills. In choosing Woodbury as the first inspector of the Boston Manufacturers Mutual whom he directly employed, Atkinson was unquestionably influenced by the young man's possession of both technical schooling and practical training. From that point of view it was a shrewd choice. It also proved a brilliant one.



COURTESY OF MISS ALICE P. WOODBURY

CHARLES J. H. WOODBURY, A.M., Sc.D.

Vice-President, 1888 - 1895

The first graduate engineer to serve the Company,
and the Factory Mutual cause

For in Woodbury Atkinson had found a man of sound training with a talent for research, a great capacity for work in searching out fact, and a gift of expression almost equal to Atkinson's own. How Atkinson made legitimate use of those qualities in Woodbury to remedy his own deficiencies in training; how he relied upon him for the searching out of scientific fact, and the translation of that fact into the everyday vocabulary—this use will be later touched on. It is sufficient here to sum up the matter in this way: Through Woodbury, Atkinson was able to demonstrate the value of technical education in industry, as well as the value of technical research procedures in insurance work for industry. And Woodbury, under Atkinson's sponsorship and encouragement, took the first practical steps in creating (outside the schools) a new branch of applied science—that of loss prevention engineering. C. J. H. Woodbury was the first member of the technical staff of the Boston Manufacturers Mutual, the first trained factory mutual engineer, to achieve that modern form of immortality—biographical treatment in the famous *Dictionary of American Biography*.

As will be recalled, Edward Atkinson was elected treasurer of the Boston Manufacturers Mutual at the end of December, 1877. He was elected president on January 21, 1878, and immediately marked his advent by including in the customary annual report of the Company the first summary of loss experience to be compiled—and the first to be made public. In that same month of January he issued his first information circular—it dealt with the need of a trained fire-fighting organization in each mill, a need that William B. Whiting had been pointing out orally since the Chicopee Mill fire of 1873 and a subject again made timely and important by the Border City Mill fire of November, 1877.

In February two more circulars appeared—one on the danger

from the faulty types of lanterns then carried by watchmen, the other on the peril from spontaneous combustion in dyed goods—the latter an aspect of the Pacific Mill fire occurring that same month. In April came the circular on fire doors, with C. J. H. Woodbury's first report—another aspect of the Pacific Mill loss. In May the lantern circular was repeated, this time giving a list of four types (and their manufacturers) that were considered safe. A circular in July dealt again with the need of fire-fighting organization—this time adding William B. Whiting's practical instructions for the formation of fire brigades made up of the employees of each mill, and emphasizing the need of the constant training of such brigades in the use of the mill's own fire-fighting equipment. Once more it was Whiting's practical experience and practical instruction, clarified, formulated, set down in print—and given wide distribution and greater effectiveness by Edward Atkinson.

Along with these circulars were questionnaires on various subjects. From one of these sprang an October circular, giving a preliminary report on the lubricating oil study begun in April. The following month, November, saw another circular appear—pointing out the need for more thought on the comparative values of oil and grease when used in lubrication; the same circular also warned against the hazards of the "burning oils" then used for illumination. Certainly, reviewing those circulars of 1878, it is clear that the mill treasurers and mill managers of New England could not well remain in ignorance of the existence of the Boston Manufacturers Mutual—nor fail to glimpse the fact that the Company's conception of its role in industry embraced much more than the mere providing of indemnity in case of loss. No such spate of printed instruction, advice, and warning, had ever before been seen in any part of the whole insurance field.

Another aspect of those early circulars is interesting. It will

be noted that they dealt with what might be called detail subjects—with parts, so to speak, and not with wholes. To change the figure, the man was beginning with trifles—in the great sense of the famous saying attributed to Michelangelo . . . that “trifles make perfection, and perfection is no trifle.” The same tendency is noticeable in the circulars of 1879; it was not deliberate, not thought out, but merely a reflection of the way in which Atkinson’s own self-education gradually developed by unconscious induction from the parts—to a system as a whole. It was December of 1879 when he set the Company’s field force of five inspectors (of whom only C. J. H. Woodbury was a graduate engineer) on a rigid testing of all the varieties of fire hose then in use, or on the market—and thus made the initial investigation from which came the Company’s later famous research laboratory. It was January of 1880 when he made his first address before the Society of Arts, at the Massachusetts Institute of Technology, on “The Relation of the Architect to the Underwriter”—thereby beginning a synthesis of experience that was to influence deeply the whole field of American architecture. And it was March of that same year in which he struck his final stride with the first of the elaborate reports that were later so characteristic.

That report of March, 1880, contained 24 large pages, running to about 15,000 words. Nothing like it had previously been seen. In the first half Atkinson printed a remarkable analysis and reworking of the loss experience records kept by William B. Whiting. It will be recalled that he had first studied those records at the beginning of 1878; since then he had been thinking them over, breaking them down into new groups and aspects as his experience grew—with the result that this ultimate tabulation of 1880 was the most complete and valuable loss-study the insurance world (and industry) had yet seen.

Just now the last half of that circular is more pertinent. Those pages were written because, in Atkinson's own words, "it had become expedient to make a statement of the objects and methods of the Factory Mutual Insurance Companies, to meet the frequent inquiries of those who desire to become members, or to extend the system." His statement of Factory Mutual objects was the first printed summary ever made, and his words still give the basic principles of Factory Mutual service. His statement ran:

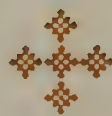
Objects

- 1st The main purpose of the system is to prevent heavy losses from the fires that are unavoidable in the nature of the work done in cotton, woollen and paper mills, metal works, machine shops, and in other works or warehouses insured.
- 2nd To prevent the occurrence of avoidable fires.
- 3rd To pay a fair and adequate indemnity for losses that must sometimes occur in spite of all care.
- 4th To reduce the cost of insurance to the lowest point consistent with the safe conduct of the business.

After two years of study—study that in essence was his own self-education—Edward Atkinson had done what no other man had had the gift to do. In the language of the law, he had for the first time codified the basic principles whose slow evolution had been an almost unconscious development in factory mutual growth. That there had been evolution is clearly shown when that 1880 statement is compared with the letter (reprinted in the Appendix) which Zachariah Allen had written to James Read in 1849, some 31 years earlier. It is immediately plain that in Allen's mind the primary consideration was mill economics. But in Atkinson's mind, and words, the mill economics (while very important) were a consequent phase of the greater problem of preventing the waste of industrial re-

sources inherent in any fire loss. That profound and fundamental shift in emphasis had been implicit in the work of Edward E. Manton and William B. Whiting. But it was Edward Atkinson who first put it into effective words, and made it a conscious code of action.

The year 1880 is thus an important year in the history of the Boston Manufacturers Mutual, and the Factory Mutual system. As Atkinson himself later declared: "In 1880 what may be called the science of preventing loss by fire was fairly entered upon." In that sense it was also a year very important to North American industry.



CHAPTER SIXTEEN

First Steps in Science

IN JUNE of 1879 Atkinson announced his intention of publishing "during the present year a text-book containing all the directions that the officers of this Company are accustomed to give when asked for advice in respect to the construction of mills, works and warehouses, with a view to safety from fire and in regard to the apparatus to be put in for the prevention or extinction of fire." The textbook was to be "about 100 pages—each page of the size of 9 by 11 inches." It was an ambitious project for a man without mechanical or engineering training, whose underwriting experience then covered less than two years. Atkinson's gifts, moreover, were as a writer of pamphlets, lectures, newspaper and magazine articles—he must soon have discovered that the long application, the discipline of mind and study, the sense of scale and form, demanded in the writing of a book were qualities that he did not have—and that, in fact, were quite uncongenial to him. That textbook, as planned, was never issued.

But in the meantime Atkinson apparently had been noticing contributions which C. J. H. Woodbury had been making to the *Journal of the Franklin Institute*. He had also been reading the quite individual letters that Woodbury just then was writing in to the office as part of his inspection reports. Twenty-eight years old, married just six months, Woodbury in the spring of 1879 was travelling through New Jersey and Pennsylvania testing the fire apparatus of insured mills. On May 9th he was testing the pumps of a mill at Bristol, Pennsylvania. The valve

to a line of perforated pipe sprinklers inside the mill was either broken, or open when it was supposed to be closed—with the result that when Woodbury started the pump the operatives in the mill were startled by a sudden shower of water. Wrote Woodbury, drily: “the Sprinkler operated with all the efficiency that could be desired . . . by those outside (the mill).” Three days later, in another Pennsylvania mill, the superintendent gave assurance that everything was ready for the test—and Woodbury started the pump. But two sprinkler valves were open this time; again there was a deluge, and Woodbury reported laconically: “the men (in the mill) thinking it part of the inspection took refuge under a board until one of them called from a window, ‘Be you in earnest about this yere?’ The jute rooms were filled about an inch and a half deep.”

The letters gave evidence of ability in expression; the *Journal* contributions showed painstaking research and a sound engineering mind. When winter came, Atkinson kept Woodbury close to him—making use of the young man’s ability to evaluate, and to translate to a layman, the different technical problems crowding for attention and decision. Once in a special report Atkinson made this interesting comment:

“The business of this Company is somewhat singular in the fact that its greatest success is attained when . . . the President is least occupied by other work than the regular routine of the office, (thus giving) leisure to study the subjects treated herein with the assistance, especially, of Mr. Woodbury whose pump inspections are necessarily suspended during the winter.”

Just how or when Edward Atkinson relinquished the textbook project to Woodbury, cannot now be determined. But there is evidence that the desire to make such a textbook timely in approach, and inclusive in treatment, had an influence on the activities of both men during 1880 and 1881. The electrical investigation is a case in point. Electric lighting was then in

its infancy; electric power in manufacturing still unborn. In 1877 Charles F. Brush, a young commission merchant of Cleveland, Ohio, dealing in iron, gave up his business and turned to this new force; up to that time the leadership in electrical invention had been in Europe. When Brush began, each electric light required a separate dynamo and his announcement in 1878 (when he was only 29) of a system whereby one dynamo could supply many lights was a great step forward. And it was December 21, 1879, before Thomas A. Edison appeared with his incandescent lamp which was hailed that day by the *New York Herald* with the headline: "It makes a light, without gas or flame, cheaper than oil!"

How fast electric lighting grew in industry, how quickly Atkinson moved to safeguard it, is well shown by a loss report issued by William B. Whiting on February 13, 1883. By that time, less than five years after the advent of the Brush arc light and barely three after Edison's incandescent lamp, Whiting could report that 82 mills were then lighted in whole or part by electricity—and contained a total of 2,518 arc lights and 10,481 incandescent lamps.* He further noted that Woodbury had found in those 82 mills a total of 23 fires caused by the new lighting, but none of those fires had gone "beyond the first stages, and consequently no damage has so far been reported to us." Whiting's further comment, based on Woodbury's study, strikingly reveals not only the Company's broad-minded acceptance of a new hazard but also its marked flexibility in adjustment to industrial advance. Said Whiting:

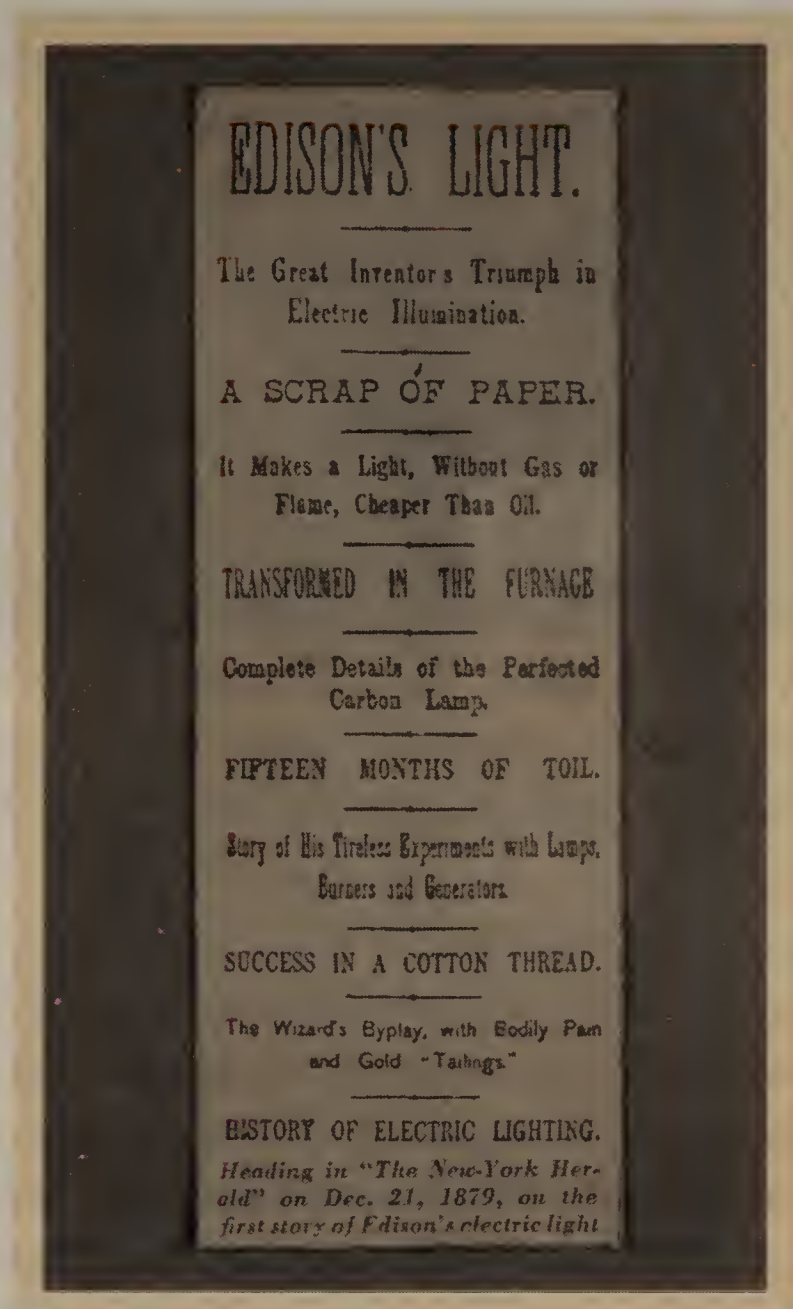
"A large proportion of these fires occurred before 1882 and before our inspections of electric plants began; since we have had the faults of the earlier cases corrected very few

*It is a striking proof of the infancy of the lighting art, that the Weston Electric Light Company was advertising in 1882: "Our incandescent lamps . . . are of twenty-five candle power, and one lamp will fully light four ordinary looms."

instances of firing have occurred, and we anticipate little trouble in the future, beyond the careful inspection of insulation before the lighting is brought into use."

Atkinson seems to have set Woodbury on the electrical investigation some time in 1881; the first mention of the subject appears in a special circular of January 16, 1882, which notes that "a thorough investigation as to the alleged dangers which may occur from the electric light" was then under way. It was probably another winter project; in its course Woodbury travelled to Cleveland where he and Charles F. Brush together made a number of experimental tests—trying to see how the few fires (whose results Woodbury had observed in New England) had been caused, and how such fires might be prevented in the future. From Cleveland, Woodbury then went to Philadelphia to talk with Elihu Thomson, the brilliant high school chemistry teacher who in 1879 (at the age of 26) had demonstrated at the Franklin Institute a dynamo that "could produce either direct or alternating current." After Philadelphia he visited Menlo Park and Thomas A. Edison, with whom more tests were made. It is interesting to note the ages of these men: Woodbury was then in his 31st year, Brush in his 33rd, Thomson in his 29th, Edison in his 35th. The new industrial science was developed by young men.

Woodbury's final report was published by Atkinson in March of 1882. It contained the rules that Woodbury had worked out, from his experiments made with the inventors themselves. Entitled "Regulations for the use of Electric Lighting Apparatus," their pioneer quality may be judged by the fact that they were accompanied by letters from two of the three principal electric companies then in the field—letters frankly stating that those companies had not drawn up any prior rules, but were gladly adopting Woodbury's as "beneficial to our customers and ourselves." Only Edison's company could show any



HEADLINES, 1879

The first newspaper announcement of
Edison's incandescent lamp, 1879

existing rules and those were dated February, 1882—just a month before Woodbury's report appeared and undoubtedly after he had visited Menlo Park. That pioneer aspect was further confirmed three years later when on April 15, 1885, the Committee on Science and the Arts, of the Franklin Institute, recom-

mended Woodbury for the John Scott Legacy Medal of the City of Philadelphia—"for his apparatus and system of securing safety in the use of electric light in mills." As Woodbury later wrote:

"One of my most cherished possessions is the John Scott medal, awarded me on the recommendation of the Franklin Institute . . . when the results (of my work) could be examined in the light of later experience."

No such thoroughgoing research in industry had ever before been sponsored by a fire insurance company. It was notable also because it dealt with a hazard from which not a penny's loss had yet been incurred by the Company. It was loss prevention in its purest form. And it displayed to the full the imaginative foresight that from then on was to mark the work of the Boston Manufacturers Mutual and its associated brother-companies in the factory mutual field.

It is a measure of Charles Woodbury's great capacity for work that along with his regular inspections, his painstaking research in electric lighting, he was also carrying on the preparation of the textbook in fire prevention which Atkinson had begun to plan in 1879. As the book grew in Woodbury's hands it was seen that it merited wider distribution than the Company could give. Accordingly the manuscript was submitted to the New York firm of John Wiley and Sons, famous publishers of technical books, and was accepted by them. The first copies of the book appeared in this same year of 1882, and were so well received that a second edition was necessary before the year was out. That book, *The Fire Protection of Mills*, also penetrated abroad and its European impact brought to Woodbury the Alsatian Medal of the *Société Industrielle de Mulhouse*—the first instance of that award being made to an American.



COURTESY OF MISS ALICE P. WOODBURY

The famous John Scott Legacy Medal awarded
C. J. H. Woodbury in 1885 for his work in
electrical safety

Again Atkinson had used Woodbury for pioneering work. That book gave the first accurate picture of the state of an industrial art, as set down by a trained engineer. It was the first engineering study to be made of that art; the first organized presentation of Factory Mutual principles and methods to be offered American industry in general. That this was no accident is shown by Woodbury's own preface to the book, in which he stated that its purpose was "to offer . . . some results of experience in the protection of manufacturing property which have not yet crystallized into books." And he added, in what was then almost a prophecy: "There is no reason, in the nature of the process or combustibility of the material, why manufactories using wood, leather, or iron, should be more dangerous than a cotton mill."

Reading that book today, it is plain that it was a product of the Boston Manufacturers Mutual. But just as clearly the authorship is rightfully credited to Woodbury. The logical

organization of the material bears the stamp of the engineer. The technical details, the mathematical formulas, the very practical approach to each topic, are those of the engineer whose theoretical training had been reinforced by sound experience in mill operation and mill inspection. Edward Atkinson could not have written that book, and wisely did not try. Neither could William B. Whiting have written it—though his influence is traceable throughout. That influence was not hidden by Woodbury; in fact his tribute in the book to Whiting is the best ever paid that devoted and unselfish man. Mentioning the evolution of factory mutual insurance from Zachariah Allen through Edward E. Manton to Edward Atkinson, Woodbury went on to write:

“The successful administration of the general policy . . . to reduce destruction by encouraging better construction of mills, modification of dangerous processes, adequate fire apparatus, and cleanliness of operation, is largely due to Mr. William B. Whiting whose mechanical judgment, experience, and skill as a manufacturer, has been devoted to the interests of the (Factory) Mutuals for many years.”

That voluntary tribute speaks well for both men. For Whiting, then 65, that self-taught and self-made as he was he could inspire such evident liking and respect in the younger man. For Woodbury, then 31, college-bred, . . . that he had the vision to recognize Whiting's quiet ability and hard-won knowledge—to which no school, save that of experience, had ever contributed.

The Fire Protection of Mills, by C. J. H. Woodbury, is thus a landmark in the history of the Boston Manufacturers Mutual—but not merely because it was the first book to be written by a member of the Company's staff. Rather its distinction comes from the fact that it was addressed to American industry in



COURTESY OF MISS ALICE P. WOODBURY

The European medal awarded C. J. H. Woodbury in 1883 for his fire protection handbook, the first time it had been won by an American

general, and made available “to the manager and builder” at home and abroad the concise and practical results of the Company’s experience with the textile mills of New England. The book was the first to advocate the automatic sprinkler, which in 1882 was still so new that it had been tested in actual use in only 30 fires. It was the first book to treat of the manufacturing advantages of one-story mills; the first to warn against the susceptibility to fire damage of the iron fronts, iron roofs; and the cast-iron posts and girders that architects and builders had enthusiastically installed in the belief that because iron would not burn it therefore gave greater fire safety. It was true that it would not burn—but heat could make it expand, and push down a brick wall. Heat could also warp it, and melt it—to make a floor sag or collapse.

There was debate just then over the use of wooden columns. It was admitted that fire might merely char the wood (where

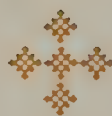
iron would surely buckle and falter) but the growing factory floor-loads raised a question of dependable strength. Thus the closing section of Woodbury's book was very timely, for it gave the results of tests of the strength of wooden columns that had been made by Professor Gaetano Lanza of the Massachusetts Institute of Technology. Those tests had been made in June and November of 1881. They were requested and sponsored by Edward Atkinson, and financed by the Boston Manufacturers Mutual. Moreover they were pioneer experiments in that they were made with full-sized columns (great 12-foot timbers of oak and pine) and not small laboratory samples . . . and they established new structural and engineering standards. Woodbury, reworking and condensing the elaborate report and tables of Professor Lanza in the light of his own independent research, made those new standards more broadly available to industry—and gave them the permanence of the printed book.

Those tests of wooden columns, as well as Woodbury's chapters on the vibration and oscillation of mills, on slow-burning construction, on the stiffness of factory floors; on fire apparatus, and loss preventive training—all such topics in the book constantly reveal a Boston Manufacturers Mutual background. The conception was Edward Atkinson's, the research (or the digesting of the research of others) was Woodbury's—as was also the concise, practical engineering expression. And on William B. Whiting's solid core of sound experience, the young engineer depended for advice and guidance. How much that meant to Woodbury is suggested by the closing paragraph of the preface to his book. He wrote: "These formulae are used to assist experience, but not to take the place of it." He then went on to quote from the historian Macaulay, as follows:

"If the engineer who has to lift a great mass of real granite by the instrumentality of real timber and real hemp, should

absolutely rely on the propositions which he finds in treatises on dynamics, and should make no allowance for the imperfection of his materials, his whole apparatus of beams, wheels, and ropes, would soon come down in ruin."

Edward Atkinson for ideas and statistical approach, C. J. H. Woodbury for engineering knowledge and engineering expression, William B. Whiting for sound judgment and experience and great practical ability—in those three men the Boston Manufacturers Mutual, by 1882, had again a team at work. It was a team remarkably adapted in its varied gifts to the new field of science that the Company had now entered.



CHAPTER SEVENTEEN

The Missionary Spirit

EDWARD ATKINSON more than once referred to his circulars and special company reports as his missionary writings and work. The description is apt. He believed, and said, that “four-fifths of the losses by fire are some one person’s fault”—and that person might be architect, builder, owner, manager, or mill hand. His address before the Society of Arts at the Massachusetts Institute of Technology, on January 8th, 1880, may be said to have begun his public career as an evangel of fire prevention. That address, made with Professor William B. Rogers presiding, was on the subject of “The Relation of the Architect and the Underwriter,” and was a vigorous attack upon the faulty architecture (from a fire prevention viewpoint) of American business and public buildings. That attack drew rebuttal in both newspapers and magazines. Called on to define safe construction, Atkinson was led to re-examine the cotton mills on which his statistics had been based. That the subject was new to him is very clear from any review of his correspondence and writings before 1878. Nowhere is there any interest in mill construction except from the standpoint of efficiency in arrangement of machinery and general operation. In 1863 he built a second mill at Indian Orchard but allowed the architect to top it with a mansard-type roof—an error of judgment and perception that he later confessed was corrected with a flat roof at the suggestion of William B. Whiting, and at an extra cost of \$10,000. For that reason his preaching of the gospel of the slow-burning construction

evolved in the cotton mills of New England, had all the fervor of the reformed and repentant sinner.

Mill, or slow-burning, construction is acknowledged as one of the two great topics * upon which Edward Atkinson's influence was most marked and most widespread. One remarkable achievement was his interesting *The Century Magazine* in a twelve-page, 10,000-word article on the subject which he wrote in 1888—and which *The Century* printed in its issue for February, 1889. To make that technical subject acceptable and palatable fare for the clientele of such a general magazine as the famous old *Century*, was no mean writing feat. And through that article Atkinson reached an audience for Factory Mutual work and Factory Mutual principles that could never have been otherwise gained. No wonder a newspaper writer, in 1894, was led to call the Factory Mutual system of mill construction and protection the "Atkinson system." It was a compliment that Atkinson promptly refused with the honest statement: "I wish I could claim the credit of it but I am no engineer and can make no such claim. The system was in full practice long before my day." But if he did not invent it, Atkinson was certainly the man who best made slow-burning construction known, who most strikingly and impressively defined it, and who thereby spread its beneficial influence over the architecture of American churches, schools, and public buildings—as well as over North American industry generally.

The origin, architecturally, of the American factory building has never fully been traced. The earliest account by a skilled observer is found in James Montgomery's *A Practical Detail of the Cotton Manufacture of the United States*, published in Glasgow, Scotland, in 1840. Montgomery had come to

*The other was the automatic sprinkler, and his work in promoting that great advance in protection will be found described in the Newcomen Society address reprinted in the Appendix.



THE MILLS OF 1840

Frontispiece of Montgomery's book, showing the York Mills in 1840. The large mill buildings have the double, or "lantern", roof

the United States in 1836 as superintendent of the mills of the York Manufacturing Company (now the York Division of the Bates Manufacturing Company) at the Falls of the Saco River in Maine. He was brought here by Samuel Batchelder, later a founder of the Pepperell Manufacturing Company. Batchelder was then Agent of the York Mills and earlier had been Agent of the Hamilton Mills at Lowell. Thus through Batchelder, Montgomery was able to study American manufacturing and mill architecture—both through Batchelder's intimate knowledge and experience (dating back to 1808) as well as by personal visits to Lowell and other mill towns. And Montgomery had behind him more than 30 years

of practical experience in the mills of England and Scotland, as a background from which to compare and judge American standards.

His account of Lowell in 1840 shows that thus early the standard of protection there included separate picker buildings, iron doors and shutters, force pumps, roof tanks, stand-pipes, hydrants, and watchmen with watch clocks. He then went on to contrast this equipment with what he had seen abroad:

“It is somewhat remarkable that in general no such provision is made in the Cotton Factories of Great Britain for the prevention of fire. Except in a few instances, there are in that country neither forcing pumps and water pipes inside, nor platforms or ladders outside the mills. Indeed there are a number of Mills in country places in Scotland that have no night watchman either in winter or summer.”

From the subject of fire protection, Montgomery then turned to the subject of mill construction. He was no rapt admirer of all things American; repeatedly in other parts of his book he flatly declares British superiority in various machines, methods, and processes. Which makes his praise, when given, the more valuable and revealing. The American factory floor was particularly interesting to him. He wrote:

“Though the Mills of this country (America) are not so high as those in Great Britain, they are generally very strong and durable. Instead of joists for supporting the floors there are large beams about 14 inches by 12 extending from side to side, having each end fastened to the side wall by a bolt and wall plate: these beams are about five feet apart and supported in the centre by wooden pillars, with a double floor above. The under floor consists of planks three inches thick; the upper floor of one inch board. Some have the planks dressed on the under side, others have them lathed and plastered: the floor being in all four inches thick, is very stiff and strong.”

Montgomery drove home the contrast by detailing the construction of the mill floors of England and Scotland, in these words:

“Instead of large beams laid across the house for supporting the floors, the Factories of Great Britain have joists about three inches by ten; these are laid on their edges about twenty inches apart, with one inch flooring above, lathed and plastered beneath or sheathed with thin boards.”

Thus James Montgomery, the Scottish millman, unconsciously laid down in 1840 one of the lines on which Edward Atkinson battled so vigorously some forty years later. For the joisted construction described by Montgomery was essentially the same as that still in use in the architecture of American homes, churches, and many public buildings. Its many concealed spaces (between the joists) made convenient flues for the spread of fire and was one of the main reasons for Atkinson's labeling such construction as “combustible architecture.” On the other hand the solid mill floor of America was exactly the so-called factory floor that carefully avoided concealed spaces, and whose great timbers and broad flat surfaces were planned to let fire beat against them but not readily catch hold. That floor, slow to burn, was a main feature of “the safe, or slow-burning construction” whose merits Atkinson so vigorously and insistently proclaimed. And Montgomery's testimony of 1840 makes it clear that that floor was an American invention and no heritage from Old England.

What unknown Yankee genius invented that floor no man can now say. The evolution of the American factory building is so anonymous as to suggest that in it we have the product of an American folk art. The conclusion is reinforced by the *Centennial History of Fall River* which was published in 1877 when men were still living whose lifetime embraced the whole evolution of the American factory. That history specifically

states that the early mills of Fall River were built without knowledge (or certainly without the use) of the derrick—a lack that is emphasized, and dated, in these words:

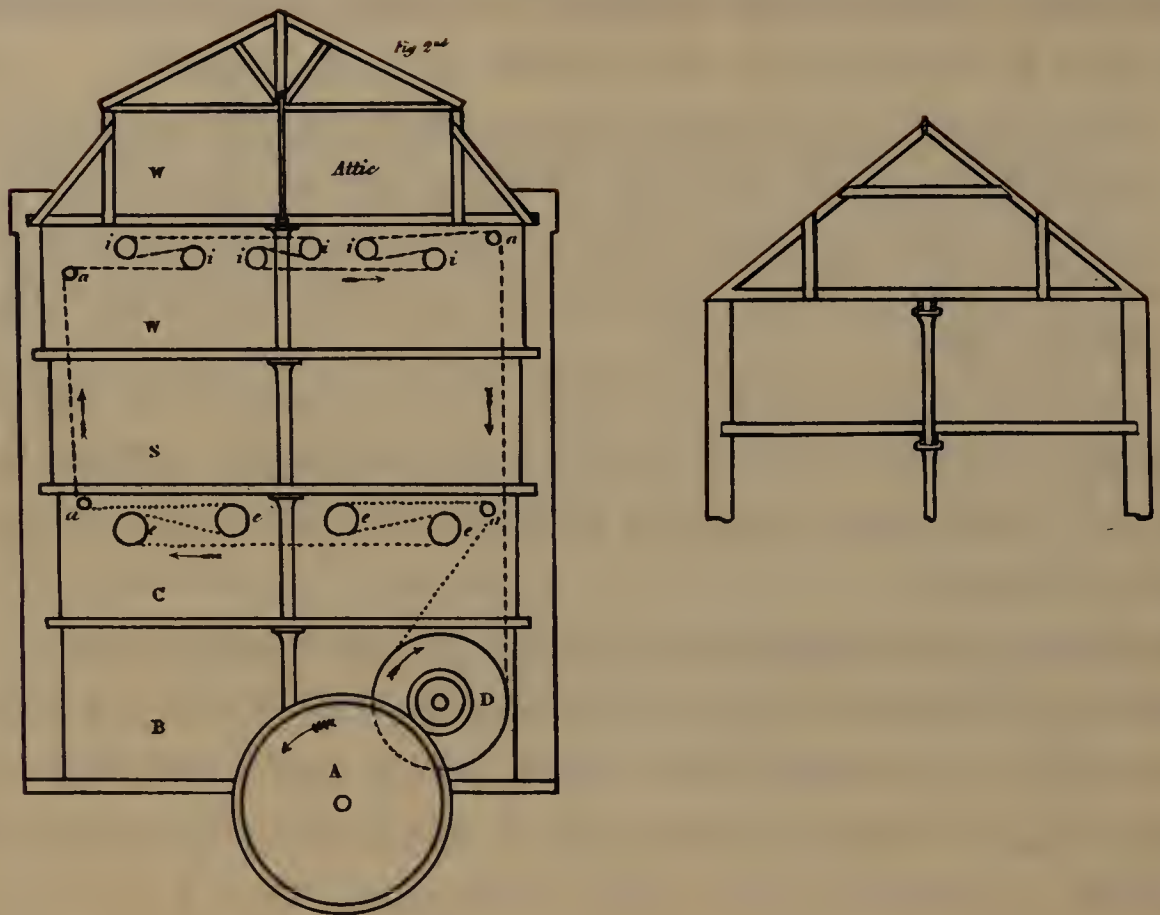
“The stones for the upper stories were carried up on hand-barrows or rolled up long inclines, and it was thought quite wonderful when Major Durfee used oxen to draw up the stone, brick, timber, etc., on the Annawan and White Mills.”

The Annawan was built in 1825 (three years after the first Lowell mill); the White in 1839. And the history further notes that not until 1846 was any Fall River mill built except by rule of thumb.

In that year, Stephen Davol built the Pocasset Mill, 219 feet long, 75 feet wide, and five stories high—the first mill in the city to abandon the width of 50 feet previously customary, and a departure so radical as to draw wide attention and many predictions of failure. Stephen Davol, self-taught millman who had risen from doffer-boy to superintendent by the time he was 26, had also another startling innovation to offer in the Pocasset. The facts are thus given in the *Fall River Centennial History*:

“Up to the building of this mill it was customary to arrange the machinery floor by floor, introducing the belts or gearing often at a disadvantage or at great expense wherever required; but in this construction (the Pocasset) the plan of the whole interior was determined in advance, the sectional drawings made, and the best connections provided for. This fact becoming known, manufacturers from abroad came to inspect the drawings and satisfy themselves that what had before been regarded as an impossibility had really been accomplished.”

Whether Fall River accurately reflected the progress in other New England mill towns, is hard to say. Certainly the conclusion that it was merely backward seems somewhat risky when it is known that Holder Borden, who died in 1837 when only



ROOF PLANS, 1840

Montgomery's plan of an American mill.
The "lantern" roof is shown at left;
the "barn" roof at right

37 years of age, had six years earlier taken over the Massasoit Mill and begun a revolution in American industry by replacing the heavy noisy gearing then common, by the leather belts that later became the standard in driving the mill machinery. Once more it was a point on which James Montgomery, in 1840, gave credit to America for leadership.

Montgomery also noted another American invention—a type of factory roof that he never had seen in Britain, and that even then was being superseded. The origin of that roof is unknown. Montgomery calls it the "double roof" and says plainly:

“The double roof is peculiar to American Factories . . . but the Mills recently built at Lowell have a plain roof, from which it seems probable that though the double roof has been the plan most generally adopted it is likely to be abandoned, as it is certainly the most expensive nor does it give so much room for machinery as the five stories and plain roof.”

The picture of the York Mills that served as frontispiece to Montgomery's book of 1840, shows that by double roof he meant what was also known as the “lantern roof” from the row of small windows that broke the roof line near the bottom. His diagrams, reproduced herewith, show that by plain roof he meant what was better known as the pitched or barn roof. Both roof-types persisted side by side in American mill yards for many years, and both proved equally objectionable from the standpoint of fire hazard. For the furring or partitions at the sides and, especially, the triangular space under the peak (known as the “cockloft”) soon were festooned with the highly inflammable lint that sifted through the cracks of partitions and walls.*

In the 1860s the mills succumbed to the lure of the ornamental mansard roof, as deadly in its fire hazard as either the lantern or the barn roof. But also in that same decade there came the final development of the flat factory roof still standard today. The first record of the flat roof, so far discovered, occurs

*It is interesting that the mill built by Zachariah Allen in 1822 had the double, or lantern, roof. It was still in place when, on Thanksgiving morning, 1879, fire broke out on the top floor of the mill. William B. Whiting's fire report reads: “The fire soon got into the cockloft and was difficult to handle, but was finally subdued. The fact that this mill had a roof whose shingles were laid in mortar, and the fire progressed more slowly in consequence, is important: with an ordinary roof (without mortar) the whole mill would have gone.” For some years Edward Atkinson carried a shingle from this mill, with mortar attached, as an exhibit in his talks on slow-burning construction.

in the 1865 report of James B. Francis on the Lowell Mills. In that report he noted that just two years earlier (in 1863) the Tremont Company had built a new mill "about 440 feet long and 70 feet wide; with five full stories and a roof nearly flat." Five years later, in 1868, a practical mill architect of Fall River, D. H. Dyer, there built the Mechanics Mill with a flat roof—and followed it with the Weetamoe and Osborn Mills in 1872, and the Sagamore and Flint Mills in 1873 . . . all with flat roofs.

Fall River was then in the great development that in ten years saw its mills grow from 15 in 1865 (with 241,000 spindles) to 38 in 1875 (with 1,280,000 spindles) and a production of cotton cloth that was one-tenth of the textile production of the whole United States. In that growth it displaced Lowell as the textile leader of New England, and with bitter appropriateness it was Fall River that in 1874 gave the final convincing proof of the fire hazards inherent in the older types of roof. In September of that year fire broke out one morning on the fourth floor of the Granite Mill which had been built in 1863 with a barn roof. William B. Whiting, reporting that fire, remarked sadly: "Sometimes a long exemption from fire begets a false security"—there was adequate apparatus installed in the mill but the management had forgotten that apparatus is useless unless men are trained to use it. The fire was speedily out of control; there was panic, and 23 operatives were killed and many others injured. And when that mill was rebuilt, the *Fall River Centennial History* notes significantly that it was topped "with a flat roof, however, instead of the barn roof which through its inaccessibility had proved itself a very fire-fiend."

In its final evolution the flat factory roof was essentially the sturdy American mill floor that James Montgomery had admired in 1840. But who was the practical genius who first



ZACHARIAH ALLEN'S MILL

The front half was built in 1822

perceived that the mill floor construction was equally logical in a roof, no man can say. The idea has been credited to William B. Whiting, in his work for the Boston Manufacturers Mutual. Certainly he was its early and influential advocate, and Edward Atkinson himself testified that it was Whiting who suggested (and who showed him how to build) the flat roof which Atkinson placed on his Indian Orchard mill some years before he became president of the Boston Manufacturers Mutual and began his real study of slow-burning construction—of which the flat factory roof was an integral part.

There was, however, as Atkinson discovered, much more to mill construction than floor and roof. His first public statement on the subject seems, as already noted, to have been in the address at the Massachusetts Institute of Technology

in January, 1880. But by 1889 he was writing to the magazine *American Architect* to protest against the faulty understanding of its principles already evident in general architecture. On Thanksgiving Day of 1889, Boston had had a serious fire involving the famous Ames Building designed by H. H. Richardson, the American architect who today is credited with having influenced Louis Sullivan who in turn was called master by Frank Lloyd Wright. Richardson was Atkinson's friend and Brookline neighbor; the two men talked over mutual problems and Atkinson later declared that "no one had greater skill (than Richardson) in applying safe methods to some of the best and most artistic of his later buildings." It was Atkinson also who said, from personal knowledge, that in designing the noted Chicago building for Marshall Field, Richardson had modeled it on the sturdy cotton warehouse building evolved by the textile millmen of New England.

The *American Architect* in reviewing the Thanksgiving Day Fire had called the Ames Building "an excellent example of slow-burning construction"—and indirectly cited its rapid destruction as evidence that such construction had been overpraised. Against this, Atkinson was able to show that the Ames Building had been destroyed by a fire sweeping across a narrow street and entering the building through "very large windows, unprotected by any fire shutters." Further, the one element of mill construction that Richardson had used was, in Atkinson's words: "the so-called factory floor, consisting of plank and boards laid solid over heavy beams without any ceiling or sheathing underneath." And Richardson had adopted it "on its merit as a floor, and not as a fire-stop."

Such partial use of what should have been taken as a whole led Atkinson to draw up his famous definitions of "What Mill Construction Is" and "What Mill Construction Is Not" that through various phrasings evolved into the version printed

WHAT MILL-CONSTRUCTION IS.

1. Mill-construction consists in so disposing the timber and plank in heavy solid masses as to expose the least number of corners or ignitable projections to fire, to the end also that when fire occurs it may be most readily reached by water from sprinklers or hose.
2. It consists in separating every floor from every other floor by incombustible stops, — by automatic hatchways, by encasing stairways either in brick or other incombustible partitions, — so that a fire shall be retarded in passing from floor to floor to the utmost that is consistent with the use of wood or any material in construction that is not absolutely fire-proof.
3. It consists in guarding the ceilings over all specially hazardous stock or processes with fire-retardent material such as plastering laid on wire-lath or expanded metal or upon wooden dovetailed-lath, following the lines of the ceiling and of the timbers without any interspaces between the plastering and the wood; or else in protecting ceilings over hazardous places with Asbestos Air Cell Board, Sheet Metal, Sackett Wall Board or other fire-retardent.
4. It consists not only in so constructing the mill, workshop or warehouse that fire shall pass as slowly as possible from one part of the building to another, but also in providing all suitable safeguards against fire.

WHAT MILL-CONSTRUCTION IS NOT.

1. Mill-construction does *not* consist in disposing a given quantity of materials so that the whole interior of a building becomes a series of wooden cells; being pervaded with concealed spaces, either directly connected each with the other or by cracks through which fire may freely pass where it cannot be reached by water.
2. It does *not* consist in an open-timber construction of floors and roof resembling mill-construction, but of light and insufficient size in timbers and thin planks, without fire-stops or fire-guards from floor to floor.
3. It does *not* consist in connecting floor with floor by combustible wooden stairways encased in wood less than two inches thick.
4. It does *not* consist in putting in very numerous divisions or partitions of light wood.
5. It does *not* consist in sheathing brick walls with wood, especially when the wood is set off from the wall by furring, even if there are stops behind the furring.
6. It does *not* consist in permitting the use of varnish upon wood-work over which a fire will pass rapidly.
7. It does not consist in leaving windows exposed to adjacent buildings unguarded by fire-shutters or wired glass.
8. It is dangerous to paint, varnish, fill or encase heavy timbers and thick plank as they are customarily delivered, lest what is called dry-rot should be caused for lack of ventilation or opportunity to season.
9. It does *not* consist in leaving even the best-constructed building in which dangerous occupations are followed without automatic sprinklers, and without a complete and adequate equipment of pumps, pipes, and hydrants.
10. It does *not* consist in using any more wood in finishing the building after the floors and roof are laid than is absolutely necessary, there being now many safe methods available at low cost for finishing walls and constructing partitions with slow-burning or incombustible material.

It follows that if plastering is to be put upon a ceiling following the line of the underside of the floor and the timber, it should be plain lime-mortar plastering, which is sufficiently porous to permit seasoning. The addition of the skim-coat of lime-putty is hazardous, especially if the top-floor is laid upon resin-sized or asphalt paper. This rule applies to almost all timber as now delivered.

EDWARD ATKINSON,
President.

Boston, April 1, 1901.

THE FAMOUS DEFINITIONS

In Edward Atkinson's final phrasing

in his article on "Mill Or Slow-Burning Construction" in the *American Architect* of April, 1893. Six years later, in 1899, Atkinson wrote sadly to the magazine *Insurance Topics*:

"I have sometimes regretted that I ever called public attention to . . . slow-burning or mill construction. It has been assumed by many . . . architects that wood disposed after the manner of mill construction will not burn and that consequently they might plan and advise to build a warehouse and other works with open stairways, unprotected elevators, small partitions, usually varnished in the most dangerous manner, and then trust to the name of slow-burning until a fire has disclosed their ignorance."

But the regret was only momentary; the missionary work continued to the end. Earlier, writing to the *American Architect* in 1888, he had given a brief glimpse of one way he worked:

"I have reason to know that many persons who have been responsible for the reconstruction of buildings after they have been injured or destroyed by fire . . . have immediately given instructions to their architects on receipt from ourselves of some of our official documents relating to the safe construction of factories.

"It is now my common practice whenever I see a notice in the paper of the destruction by fire of a hospital, an asylum, or college building, to become an anti-combustion missionary—and send these documents to the person whom I may assume to be charged with the rebuilding."

An early American scientist, Joseph Leidy, once said that a lag of twenty years could be counted upon between the promulgation of an idea—and its general understanding and acceptance. In his circulars, Atkinson's first mention of mill construction came in March of 1880; the subject was given only one page. In September of the next year he put out the first issue of his famous Report No. 5—but only three out of the Report's sixteen pages were given to mill construc-

INSURANCE ENGINEERING EXPERIMENT STATION

UNDER DIRECTION OF

Boston Manufacturers Mutual Fire Insurance Co.

INCORPORATED 1850

185 FRANKLIN STREET, BOSTON, MASS.

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REPORT No. 5.

Slow Burning or Mill Construction

BOSTON, MASSACHUSETTS, U. S. A.

September, 1902

SECOND EDITION

September, 1904

THIRD EDITION, REVISED AND ENLARGED

May, 1908

Reprint, November, 1912, November, 1913, November, 1915, January, 1920 and January, 1925

PRICE, 50 CENTS

The 1925 cover of Report No. 5 whose first
version appeared in 1881

tion. By steady revision and enlargement it grew, however, until the edition of 1901 was devoted entirely to the one subject . . . an evolution oddly reminiscent of the dictum of Professor Leidy.

Through the years that Report No. 5 kept abreast of building progress until a later edition (that of 1925, twenty years after Atkinson's death) pictured almost wholly the reinforced concrete mill construction that had largely replaced the wooden beams and timbers of Atkinson's day. But the 1925 edition still contained, as pertinent, the statement of mill construction—what it was, and was not—that Atkinson had revised for the final time in 1901. Between 1901 and 1925 the industrial scene had vastly changed. New materials, new methods, a new age—of steel, electricity, and the automobile—had come in. But with all the changes, the principles that Atkinson had worded so clearly in 1901 were still applicable, still sound. Report No. 5 was his most widely known, his most influential missionary effort. It still is a monument to his public spirit.



CHAPTER EIGHTEEN

The Strong Band of Brothers

As previously noted, in Chapter Thirteen, the fire of November 17, 1877, in the Border City Mill of Fall River, was the first large loss in which all of the insurance was in Factory Mutual companies. There were 12 companies involved but as Edward Atkinson later reported, only one of those companies maintained an inspection force. That company was the Boston Manufacturers Mutual whose three inspectors, under the supervision of William B. Whiting, made approximately annual visits to each of the mills insured—and their reports, as digested and communicated by Manton and Whiting, were made freely available to the other companies. In effect, those other eleven companies, in 1877, were still following the system of inspection (by company officers only) that the Boston Manufacturers Mutual had partially abandoned in 1862 with the coming of William B. Whiting and had completely abandoned in 1871 with the employment of another inspector who was not an officer of the Company.

The Border City Mill fire revealed the danger of this plan in the face of the growing complexity brought about by technological advance. As the old saying runs: what is everybody's business is nobody's business—and the failure to discover the closed (and vital) connection to the city water supply undoubtedly arose from this lack of any primary responsibility on any one man or set of men. The loss further revealed that the policy forms of the twelve companies varied; there was also some lack of concurrence in the insurance coverage. They

were the type of faults inevitable in rapid growth and loose organization. To use the terminology of government, the Factory Mutual system had developed under Edward E. Manton as a virtual hegemony, and the plan had worked well during his prime. But the time had now come when a more closely knit organization was needed. To insure uniform standards the vital inspection work needed to be centralized. Contact between the companies must be close and frequent. It was time for hegemony to give way to a democracy—a democracy of equals. It could not be done in a day.

To Edward Atkinson unquestionably belongs credit for seeing that need, and for the creation of the famous “Conference” that followed. Other men aided him: Colonel Thomas J. Borden of Fall River, Rhodes B. and Roger B. Chapman of Providence, Charles E. Whiting of Whitinsville, were strong in support. The first practical step was taken early in 1878 when the system of inspection was changed from an annual to a quarterly basis. The Boston Manufacturers Mutual added a fourth inspector; the Arkwright Mutual of Boston (of which Atkinson had been a director since its founding in 1860) added another; the State Mutual of Providence, then headed by Rhodes B. Chapman, also contributed an inspector. Coordination of their work was the province of William B. Whiting.

By 1881 the inspection force had grown, and then consisted of eight inspectors—of which the Boston Manufacturers Mutual contributed six. That evolution was summarized by Edward Atkinson in a report dated March 23, 1883, as follows:

“Shortly after January 1, 1878, arrangements were made for systematic quarterly inspection in respect to the general order and condition of the risks, and for annual inspection in respect to pump and pipe service. The force of inspectors was somewhat increased, one (C. J. H.

Woodbury) being added by the Boston, one being added by the State Mutual, and one by the Arkwright Mutual; three being then in the service of the Boston Manufacturers Mutual Fire Insurance Company. The force first employed by the Boston Company under the agreement for joint service, therefore, consisted of four inspectors, to which two have since been added by that Company. One draughtsman was then employed in the office, and one clerk in the distribution of reports (of the inspectors); but one additional clerk has been required and one copyist. This additional force of two inspectors and two clerks has been employed by the Boston Company more than three-quarters of the time since January 1, 1878, at their own sole expense."

The first plan of organization of the Factory Mutual companies was drawn up by a committee of seven, appointed on December 14, 1877. The committee's first draft, presented late in December, was rewritten and finally presented to the companies on February 13, 1878. It called for the appointment of a general committee to meet monthly, for the preparation of "an exact system for the classification and rating of risks"; a uniform system of loss settlements; a standard form of policy; and the sharing of expenses by all companies.

The next meeting of which there is record was held a year later, on February 13, 1879, with eleven companies represented, and further steps were taken toward a common policy. A third meeting in July was devoted to just one subject: concurrent action on the question of night operation of mills. The fourth meeting of which there is record did not come until September, 1880—again with only eleven companies noted as participating. This meeting approved the blanket form of policy that Edward Atkinson had advocated as early as 1868 but whose advantages had only gradually been seen by the mill owners and managers themselves. The following

January, 1881, came the formal adoption of the blanket form by the Factory Mutual companies.

Once again there is a blank in the record. Not until January 16, 1883, was the first meeting held which began a regular monthly meeting of the executive officers of the companies—and the free and constant interchange of experience in action, planned and advocated by Atkinson in 1877. And it may safely be said that the five-year interval between December 1877 and January 1883 was the time required for Atkinson to demonstrate the advantages of the close fellowship that from then on marked Factory Mutual operations.

Here again it was Atkinson's quick perception of the advantages of solidarity, his constant emphasis upon a brotherhood of action even at the expense of individual company achievement, that brought about the desired effect. The first treatment of the Factory Mutual companies as a brotherhood came in Atkinson's special report of March 20, 1879, in which he printed the first complete compilation of Factory Mutual results ever made. That compilation showed seventeen Factory Mutual companies then in existence of which three (including the Boston Manufacturers Mutual) had been formed between 1835 and 1850; five more between 1854 and 1868, and nine from 1870 to 1875. In those 43 years the seventeen companies had written insurance of two billions of dollars of which 26 per cent had been written by the Boston Manufacturers Mutual. On that volume the seventeen companies had had losses of six million dollars (about 29 cents on each \$100 of insurance) and had returned to their insured members more than ten million dollars in unneeded premiums—for a net cost of 41 cents on each \$100 of insurance.

That was the approximate situation during the first year of the quarterly inspections by a central force of inspectors under the supervision of Atkinson and William B. Whiting.

Four years later, in January 1883, Atkinson could report that with two more companies (organized in 1880 and 1881) the nineteen associates of the Factory Mutual system had written another billion dollars in insurance, had had losses of about two and a half millions, and had returned unneeded premiums of nearly five and three-quarter millions more. Against the aggregate loss record to January 1879, of 29 cents, the losses since then had been less than 25 cents per \$100 of insurance. Against the net cost to January 1879, of 41 cents, the cost to members in the four years since had been only 28 cents per \$100 of insurance. It was the kind of pragmatic proof that New England accepts: on that practical demonstration by Atkinson of the wisdom of close association, all subsequent progress was based. And it is an interesting proof of Atkinson's thorough devotion to the cause, and his effort to build up the strength of the brother-companies, that in those four years he allowed the share of the Boston Manufacturers Mutual in the insurance written to decline from 26 per cent to about 20 per cent. It was a sacrifice ungrudgingly made by the leader for the benefit of the group as a whole.

Five years later, in February 1888, Atkinson reported further:

"The full benefit of concurrent action in the matter of inspections and of the additional safeguards for preventing loss has been enjoyed only during the last four years—1884, 1885, 1886, and 1887—during which term . . . the cost of insurance . . . has been but a fraction over 19 cents on \$100. . . . And the proportion of loss to net risks carried during the last five years, 1883 to 1887 inclusive, has been 16½ cents per \$100."

The lesson of history is that brotherhood never comes into being full-formed. Whether with men, with states, with nations, the process is an evolution—a learning by experience of the

art of working together, for the good of all. It was in January, 1887, nine years after the first agreement on joint inspections, that the Conference of executive officers of the companies definitely set up the central Bureau of Inspection—electing William B. Whiting as its chief. The next month the Conference minutes record this significant action: “Voted, that circulars be printed for the use of the different Companies relating to Fire Doors, Fire Departments for Mills, and Lanterns for Watchmen.” The Conference thus formally recognized and adopted as its own the trail-blazing circulars that Atkinson had first issued in 1878 for the Boston Manufacturers Mutual.

In his report of February, 1888, Edward Atkinson also recorded another advance in these words:

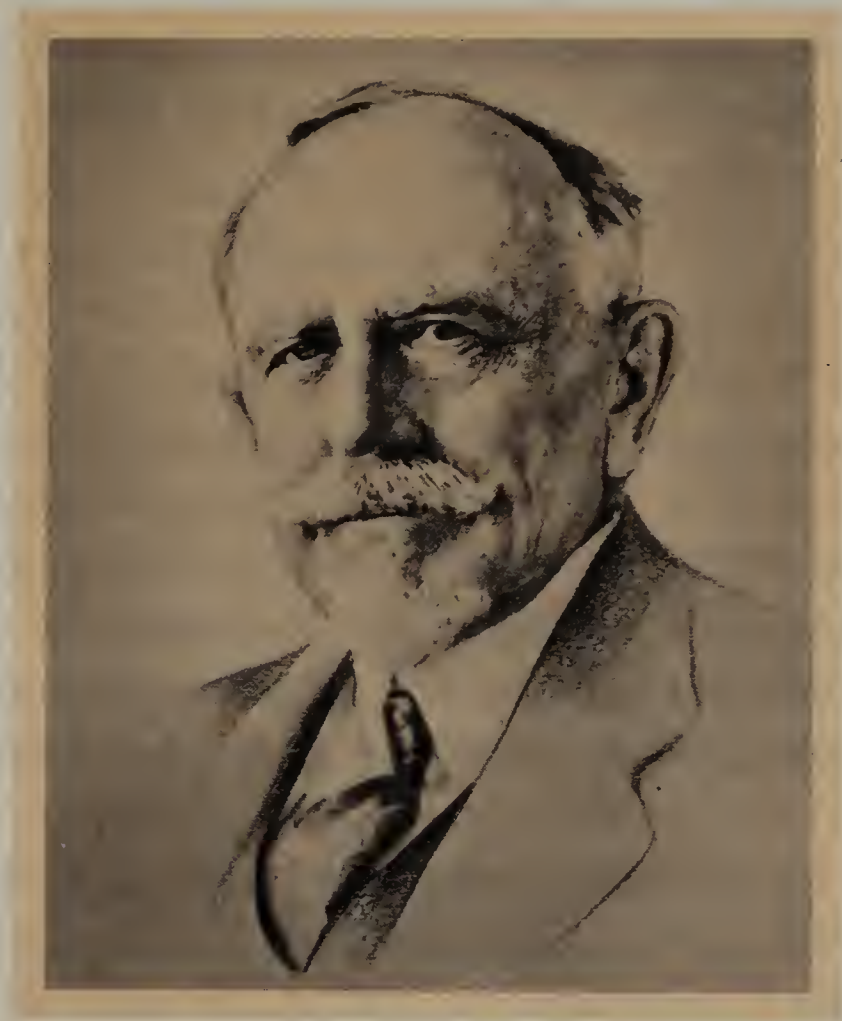
“Great attention has lately been given to the condition of the apparatus in chief, viz., pumps, pipes and hydrants in our largest risks or in places where there is the greatest concentration of mills. . . . Mr. John R. Freeman, a competent hydraulic engineer, has been added to our force, with a view of making an exhaustive examination whenever called upon to do so either by the Associated Mutual Companies or by the owners of works . . .

“In undertaking a complete and scientific review of all such apparatus, new duties have been added to the former functions of the underwriters. . . . We believe, however, that no money has been better expended than the sum which is now applied to the cost of this service.”

John Ripley Freeman was the second graduate of the Massachusetts Institute of Technology to enter the Factory Mutual organization. When he came to the Bureau of Inspection in March of 1886, he did so on the recommendation of James B. Francis of Lowell whom Atkinson later described as “one of my chief advisers” in the securing of trained personnel. Born in 1855 in a Maine village, Freeman had entered the Institute while C. J. H. Woodbury was also a student—and had grad-

uated in 1876 with Waldo E. Buck who was destined later to follow Freeman as the third Institute graduate to take up Factory Mutual work.

After graduation John R. Freeman, then 21, had entered the employ of the Essex Company of Lawrence as an assistant to its famous engineer, Hiram F. Mills, who was noted for his "severe discipline and insistence upon accuracy." Heading the Essex Company was Charles S. Storrow, still vigorous, who had laid out the city of Lawrence, been influential in the



JOHN R. FREEMAN, Sc.D.

The second graduate engineer to enter Factory Mutual work (in 1886), and praised by President Herbert Hoover (in 1929) as "the foremost of American engineers"

creation of the Lawrence Scientific School at Harvard College, and, more particularly, had been in 1850 one of the founding group of the Boston Manufacturers Mutual. Through Mills and Storrow, young Freeman also had close contact with James B. Francis and he later remarked of his ten years (from 1876 to 1886) with those men that anyone "who trained under . . . Mills, Francis, and Storrow, was 'tempted upward'." Again the Factory Mutual development was indebted to the "Waltham system" cities of Lowell and Lawrence.

The first general research project sponsored by the Conference was the exhaustive investigation, backed by exacting laboratory tests, of the automatic sprinkler—of which the first installations had been made about 1875, and regarding which there was still much doubt. The investigation was placed in the hands of C. J. H. Woodbury and his resultant 56-page report of March 1884, was as pioneering in its field as his earlier electrical report of 1882. Not only did it set standards; it also included Woodbury's careful study and summary of the 128 known instances (all that were available at the time) in which the automatic sprinkler had performed in actual fires. And those standards, tests, and actual results reported by Woodbury gave powerful support to the cause of the automatic sprinkler.

The second Conference research project was the series of very exhaustive tests, of fire streams, fire hose and nozzles, made by John R. Freeman in 1888 in the mill yards at Lawrence. Following these there came the next year, under the supervision of Colonel Thomas J. Borden and William B. Whiting, the specifications drawn by Freeman for the improved steam fire pump that under the name of the "Underwriter" pump became a standard of benefit to all industry.

In the summer of 1884 the Boston Manufacturers Mutual moved to a new office, and the Bureau of Inspection accompanied it. The new quarters were in the Bowdoin Building at 31 Milk Street—a location that had special significance to Edward Atkinson because it was the site of the store of James Read, the Company's founder, where Atkinson as a boy of 15 had begun his business career. In a corner of the room occupied by the Bureau of Inspection, C. J. H. Woodbury set up apparatus for small tests—all larger projects being made at the Institute of Technology or in quarters temporarily loaned by various mills. About the time John R. Freeman came to the Bureau more space was needed and as Edward Atkinson later wrote (in March, 1902): "It became necessary for the Associated Mutuals to establish a small physical laboratory in the basement of our office building in order that continuous tests might be made of air valves, sprinkler heads, electric problems and the like, and since that time a small amount of money has been annually appropriated by the Joint Inspection Committee to the conduct of this laboratory."

The work done in that laboratory by Woodbury and Freeman, with the encouragement of Atkinson and the keenly practical advice of William B. Whiting, was the pioneering research effort in its field. It was, in fact, the first permanent laboratory set up "for the testing of fire protective apparatus in this country, and apparently the first in the world." And as Edward Atkinson could write (again in March, 1902):

"It is very satisfactory to be able to state that among all the rules which were established in the first ten or fifteen years of our practice in methods of construction, in electric lighting, in the standards of pumps, hydrants, hose and other subjects with which we then dealt, we have never been called upon to withdraw or modify our first suggestions. There has been, of course, constant development in

order to meet the new conditions of invention, but all the original principles first laid down have stood the test of time without any important modification.”

The present Factory Mutual Laboratories on High Street, Boston, and at Norwood, Massachusetts, stand today as monuments to that early pioneer work. They are also the living embodiment of the tradition of imaginative research in loss prevention engineering begun by Atkinson in 1878 with the aid of the Massachusetts Institute of Technology—and developed in the 1880s as a continuing and continuous practice in the Bowdoin Building on Milk Street. That tradition, that practice, that foresighted service to industry, is thus now approaching its three-quarter century mark.

Meanwhile under the evangelical work of Atkinson the Factory Mutual field was expanding. By March of 1884, the New York *Daily Commercial Bulletin* was referring to him as the “most prominent representative of mutual fire insurance methods and practice.” In that same year another writer was alluding to his “admirable missionary work” and adding:

“We know of no one in this world who of late years has labored more assiduously and successfully in drawing public attention, through the press, to our national shortcomings in the line of what he aptly terms ‘combustible architecture’.”

By 1885 a visiting English expert, sent over to report to the Royal Institute of British Architects on American mill construction, planning, and methods, was so impressed by the Factory Mutual effort that he wrote the Manchester (England) *Guardian*: “The prevention of loss by fire is the chief function of the Mutuals; the secondary purpose is to pay indemnity for actual losses.” In that year the nineteen companies of the Factory Mutual system wrote four hundred

millions of dollars in insurance—at a net cost to members of a trifle over 15 cents on each \$100 of insurance. And Edward Atkinson was boldly predicting that the future would see that cost reduced to 10 cents, and lower.

By 1886 the general insurance press was carrying articles on the two systems of fire insurance that had now arisen in America, and labeling the one as “Indemnity” and the other “Self-Protection.” These two contrasting systems were then defined (in words that echoed Edward Atkinson) as “indemnity pure and simple,” and “protection and avoidance (of the need) of indemnity.” American business and American industry, the country over, were being made conscious of the Factory Mutuals of New England.

In 1885 Atkinson spoke before a meeting of manufacturers in Minneapolis, Minnesota; in 1887 he addressed the manufacturers of Philadelphia, Pennsylvania. Cotton and woolen mills, machine shops, and related risks, were still the principal classes insured by the Boston Manufacturers Mutual and its brother-companies. But manufacturers in other fields—rubber, boots and shoes, iron and steel—were asking for the same protection and reduction of insurance costs. In response, new Factory Mutual companies were organized—five between 1884 and 1887 alone. These companies, named by Atkinson the “Junior” companies, perforce entered fields and took on classes of risks for which the older (the “Senior”) companies did not feel ready. In 1887 these new companies organized their own Conference, patterned after that of the Senior companies, and under the title of the “Associated Factory Mutual Insurance Companies, Southern and Western Districts,” they pioneered in the development of Factory Mutual methods in the South and West—the Senior Conference tacitly limiting its field to the territory north of the Potomac River and east of Indiana.

Later, Edward Atkinson declared: “If I were somewhat

younger I should like to run a Junior company covering a wide area of miscellaneous hazards, alongside of our own Company to see which would prove to be the most successful on the mere question of underwriting when operated under the same direction." By that time (1905) the Junior companies had demonstrated through trial and error the feasibility of extending Factory Mutual protection to such classes as tobacco factories, enameling and japanning works, boot and shoe factories, rubber, furniture, and wagon factories—the two Conferences together thus reflecting the growing diversification of North American industry. The steady gain in similarity of work and interest brought about a natural trend toward a consolidation of the two Conferences. This was finally effected in 1922, after which time all distinction of Senior and Junior disappeared. There was just one family—the Factory Mutual brotherhood.

When Edward Atkinson died suddenly on December 11, 1905, in his 78th year, he had had the satisfaction of seeing the Factory Mutual companies, both Senior and Junior, write in one year insurance that totalled almost a billion and a half dollars—the actual figure was \$1,400,000,000, and a sevenfold increase over the annual volume of \$200,000,000 written in 1879. He died as he had lived, still looking forward. Like Edward E. Manton, his gifted predecessor, he died also in harness. In 1902 he had worked for the establishment of a Department of Insurance Engineering at the Institute of Technology. Failing in that effort, he had turned undismayed to the raising of funds with which he built and equipped an Insurance Engineering Experiment Station that was operated under the direction of Professor Charles L. Norton, of the Institute, who was then 32 years of age. Supervision of the Station rested with the directors and officers of the Boston

INSURANCE ENGINEERING EXPERIMENT STATION.

EDWARD ATKINSON, DIRECTOR.

No. 31 MILK STREET, BOSTON.

PROF. CHARLES L. NORTON, IN CHARGE.

SUPERVISORS.

JOSEPH P. GRAY, CONSULTING ENGINEER.

The present Board of Directors and Executive Officers of the Boston Manufacturers Mutual Fire Insurance Company.

EDWARD ATKINSON,	JONATHAN CHASE,	ARTHUR T. LYMAN,	THEOPHILUS PARSONS,
FREDERIC AMORY,	CHARLES W. AMORY,	GEORGE N. NICHOLS,	ARTHUR B. SILSBEE,
GEORGE DEVER,	WILLIAM H. BENT,	NORMAN B. CHASE,	EDWARD T. PIERCE,
HOWARD STORRIS,			

EDWARD ATKINSON, President. JOSEPH P. GRAY, C. E., Vice President.

Members of this and other Factory Mutual Companies recently admitted may not have received information regarding the Reports of the Insurance Engineering Experiment Station and other reports issued by the Boston Manufacturers Mutual Fire Insurance Company which may be of service to them.

We are not soliciting contributions, although they will be very welcome, as the work of the Engineering Station is broadening and we are now preparing to be fully informed on all types of concrete construction, especially the block concrete, which is rapidly coming into use in auxiliary buildings, in factory dwellings, and, at the present time, in the walls of a large mill otherwise of slow-burning construction, the block concrete for the outer walls being much less costly than the customary wall of brick.

The following is a list of the Reports thus far issued:—

- No. I. Fire-Proof Wood—So-Called.
- No. II. Sound-Proof Partitions.
- No. III. Wired Glass—Diffusion of Light.
- No. IV. Corrosion of Steel.
- No. V. Slow-burning or Mill Construction.
- No. VI. Mud Fuel, Coke, Gas.
- No. VII. Fire-Resistant Roofs for Foundries and Machine Shops.
- No. VIII. Diffusion of Light.
- No. IX. Second Laboratory Report on Corrosion of Steel.
- No. X. Test of Columbian Fire-Proof Construction.
- No. XI. Fire and Heat Resistance of Lauzer Prism Glass Electro-Glazed.
- No. XII. Bog Fuel, Coke, Gas and Secondary Products of Gas.
- No. XIII. The Conflagration in Baltimore.
- No. XIV. The Protection of Theatres.
- No. XV. Bog Fuel.
- No. XVI. Composition Roofing.
- No. XVII. Composition Roofing, Concrete Basement Floors.
- No. XVIII. Fire-Proof or Non-Inflammable Wood.

Reports issued by the Boston Company, especially No. 78, giving the list of all the various types of apparatus that are needed in our service, together with a list of makers of hose, pumps, and other apparatus who maintain the full standard required, has proved to be of great use to our older members.

We name these Reports of the Boston Company in this circular, as it may be sent to some of the members of the Mutual Companies that are not insured by that Company, to whom many of these documents may be sent on request.

Respectfully submitted,

EDWARD ATKINSON.

Director.

BOSTON, October 26, 1905.

AN ATKINSON CIRCULAR, 1905

A circular of Edward Atkinson's, showing the advanced industrial research being done more than 45 years ago by the Insurance Engineering Experiment Station which he established

Manufacturers Mutual but its reports were at the service of all Factory Mutual companies, architects, engineers, builders, and North American industry in general.

The forward-looking spirit behind the work of that Experiment Station was well revealed in December, 1904, when Atkinson wrote what proved to be his last annual report. He then said:

“The voluntary contributions which have been made for the support of the Insurance Engineering Experiment Station are enabling us to be prepared for changes in future methods of construction in steel, cement, re-inforced concrete, and many other subjects *which are not yet questions in present practice but which may ere long become so.*”

The italics are justified. The imaginative foresight in research thus revealed was the same he had displayed in his early projects of 1878. But the quality was no longer merely individual. By constant teaching, by hard pragmatic proof, Edward Atkinson had created a tradition of industrial service, of research in advance of the event or need. It was a tradition that was to characterize all future work of the Boston Manufacturers Mutual and its Factory Mutual brothers.

A recognition of that spirit is implicit in the memorial resolution adopted at the first meeting of the Conference of Factory Mutual executives that was held after Atkinson's death. The resolution was offered by John R. Freeman, himself the one man in the Factory Mutual ranks who was to become (after Atkinson) the most widely known public figure in circles outside the Factory Mutual field. John R. Freeman said:

“His fellow-members (of the Conference) desire to express their recognition and appreciation of his strong individuality, his unusual versatility, his persistence and



EDWARD ATKINSON, LL.D., PH.D.

President, 1878-1905

Director, 1865-1905

*"His influence extended far beyond the
limits of his own Company, . . .
wherever the principles of fire
protection were in question"*

fearlessness in following his convictions, his pride in the past and his great faith in the future of the (Factory) Mutual system."

When Yale University in 1903 offered the pioneer college course in insurance, it was to Edward Atkinson that the editors of the resultant textbook turned for the chapter on Factory Mutual history and principles that climaxed the section on "Prevention of Losses." That turning adds point to the resolutions adopted by the directors of the Boston Manufacturers Mutual in the week after Atkinson's death. They were drawn by Howard Stockton, senior member of the Board, whose service had begun in 1878 when Atkinson became president—and who thus had seen at first hand the beginning and the great growth of Atkinson's work. In part those resolutions ran:

"His influence extended far beyond the limits of his own Company, not only to the Associated Mutual Companies which looked to him largely for advice and guidance, but to the community at large wherever the principles of fire protection were in question.

"He found the system of Factory Mutual insurance chaotic. He left it a perfectly organized machine."

To change the phrase, Edward Atkinson found the Factory Mutual companies a family whose sense of kinship, of solidarity, was largely nascent. He guided and formed them into a close-knit group—a strong band of brothers.



CHAPTER NINETEEN

Yesterday, Today — and Tomorrow

OTHER figures had also passed. William Amory had died in 1888; Phillips Brooks preached the funeral sermon at the services in famous Trinity Church on Copley Square. In 1892 James B. Francis had ended his remarkable career, from English immigrant boy to America's most noted hydraulic engineer. He was a member of the Corporation of the Massachusetts Institute of Technology, a sponsor and developer of the school's youthful graduates—and a force in Factory Mutual engineering growth through his pioneer work at Lowell and his wise advice to Edward Atkinson on Factory Mutual problems.

Ten years later (in 1902) Colonel Thomas J. Borden had died. His military title came from actual service in the Civil War. He had been president of the first mill at Fall River to be built (in 1868) with a flat roof; he had also been the first textile manufacturer to equip his mill with the then new automatic sprinkler. He had founded in 1870 the Fall River Manufacturers Mutual; had become a director of the Boston Manufacturers Mutual at the same time Edward Atkinson was made president, and he had been Atkinson's vigorous supporter and companion in bringing the other companies into the Factory Mutual Conference.

And finally, in May of 1904, Charles S. Storrow had died at the age of 95. He had been the engineering builder of Lawrence, had written the first engineering textbook by an American—and he was the last survivor of the group of seven

men who in 1850 made up the first board of directors of the Boston Manufacturers Mutual. Born in 1809 his life was thus a part of two centuries.

In the Company itself, William B. Whiting had died in January of 1894, in his 77th year. The memorial resolution honoring his thirty-one years in the Company can still be read in the ancient minute book. It speaks of his "rare executive ability, even temperament, and just regard for the rights of others." It names also "his practical knowledge, tenacious memory, firmness in judgment, and stern integrity"—and adds: "Few men have done more service to the textile industry."

The quality of "stern integrity" emphasized in that resolution, was unquestionably the foundation upon which rested the confidence that Whiting had won from all the associated companies in his work as chief of the Bureau of Inspection. That integrity had made workable the early rule of the Conference that no risk would be written by the Conference companies without the prior and impartial survey of the Bureau of Inspection. The slightest taint of prejudice, of the favoring of one company—even of the Boston Manufacturers Mutual of which he was vice-president—would have shaken that confidence and made the growth in brotherhood impossible. "Even temperament; firmness in judgment; stern integrity": under the circumstances those phrases are a revealing, just, and noble epitaph for William B. Whiting.

On Whiting's death, John R. Freeman was made the new chief of the Inspection Bureau but in two years he resigned to become president of the original company founded by Zachariah Allen in 1835—the Manufacturers Mutual of Providence. He was the first graduate engineer to head a Factory

Mutual company. Three years later (in 1899) his classmate of Institute days, Waldo E. Buck, also left the Bureau to head the second oldest Massachusetts company—the Worcester Manufacturers Mutual, founded in 1855. Seven years later still, when Joseph P. Gray succeeded Edward Atkinson as president of the Boston Manufacturers Mutual, it was again a graduate engineer who now headed the Company. Thus was set the pattern which had arisen from the change in Factory Mutual work effected by Edward Atkinson (the change from underwriting to loss prevention engineering)—a pattern that by five years after Atkinson's death is said to have resulted in the presence, in various capacities, of 90 graduate engineers within the Factory Mutual ranks. That pattern is also responsible for the fact that today the head of every Factory Mutual company is by education and experience a trained engineer.

When Joseph P. Gray became president of the Boston Manufacturers Mutual he inherited a Company whose annual volume under Atkinson had increased 92 per cent in the eight years from 1897 to 1905—and 510 per cent in the whole twenty-eight years (since 1877) in which Atkinson had led. In 1877 the net cost to members had been 26¢ per \$100; in 1905, Atkinson's last year, that same insurance cost had been driven down to less than 7 cents per \$100. His bold prediction of a 10-cent cost (a prediction made twenty years earlier) had been splendidly fulfilled.

Gray had been with Atkinson some 14 years. Born in Lowell in 1851, he was 40 when he entered the Company's employ—and 54 when he became its fourth president. He had not had an easy road. He had worked his way through the Massachusetts Institute of Technology; he was 26 when he graduated in 1877, a year later than Freeman and Buck. He next spent several years in Government service, as a civil engineer on



JOSEPH P. GRAY

President, 1906-1929 Vice-President, 1894-1906
President Emeritus, 1929 - 1941

Mississippi River projects, and then had returned to Lowell about 1881 to spend ten valuable years as an assistant to James B. Francis before the latter recommended him to Edward Atkinson. As a special engineering assistant to Atkinson, Gray began his career with the Boston Manufacturers Mutual in the summer of 1891.

His work with Atkinson was at first very much like that done by C. J. H. Woodbury in 1878. The latter had been made 2nd vice-president in 1887; when William B. Whiting died in 1894, Woodbury became vice-president—and Atkinson moved Gray up behind him. That same year Woodbury resigned, to take charge of all fire prevention work for the American Bell Telephone Company . . . and Atkinson made Gray vice-president. That rise, in four years, is evidence that he had been found dependable. In 1899 when the Navy Department at Washington asked help in equipping the Brooklyn Navy Yard for fire safety, it was Gray again to whom Atkinson turned. And Gray made the study, and drew up the layout on Factory Mutual standards that was followed in the fire protective equipment of the Yard.

In January, 1904, the conflagration at Baltimore, Maryland, shocked architects and underwriters with its demonstration that the word “fireproof” was a sad misnomer when used (as it had been) for buildings in which inflammable trim, unprotected floor openings, and dangerously combustible contents violated the basic principles of safe construction. There had been displayed the same tendency towards making a fetish of a word, or installation, that C. J. H. Woodbury had noted in 1882 (in his comment on fire equipment installed, but never used for practice)—and of which Atkinson had complained in 1899 over the misuse of the words “slow-burning.” To Baltimore, therefore, Atkinson promptly sent Gray and Professor Norton, of the Massachusetts Institute of Technology,

to make careful examination of the ruins. Their joint report, issued in March of 1904 and widely distributed, remains a classic study of the Baltimore fire—as well as a milestone in the evolution of the modern steel-framed building of reinforced concrete construction.

Under Gray as president the Boston Manufacturers Mutual entered upon a new period of remarkable growth. The first ten years saw a doubling of volume—from 214 million dollars in insurance written in 1905, to 407 million in 1915. In the next decade the growth was even greater—from 407 million to more than one billion in 1925. By 1929 when Gray resigned at the age of 78 (and was made president emeritus) the insurance volume had risen to one and a quarter billions . . . and the net cost to members during his last seven years had never once exceeded 3 cents per \$100 of insurance.

What lay behind those figures is revealed in Joseph P. Gray's last annual report. In that report, for the year 1928, he glanced at some of the problems of the 1920s—the great textile depression in New England, the new hazards in industry such as the use of lacquer finishes. And then he wrote:

“We have now completed a period of eleven years with a loss ratio of less than 3 cents of each \$100 of insurance carried, the maximum being 2.82 cents and the minimum 1.19 cents. . . . I know of no other insurance company that can show such a record for this period of time.”

Those results were the wonder of the general insurance world. They were the fruit of imaginative loss prevention research, of constant loss prevention watchfulness, of skilled loss prevention engineering. They proved to the hilt, the Factory Mutual know-how.

On July 1st, 1929, Lewis Henry Kunhardt became the Company's sixth president. Born in Brooklyn, New York, in 1869,

he had graduated from the Massachusetts Institute of Technology in 1889, and the following year had entered the Bureau of Inspection (now the Engineering Division) of the Associated Factory Mutual companies. First employed as a draftsman, by 1896 he headed the Plan Department and ten years later, in 1906, he became vice-president and engineer of the Boston Manufacturers Mutual. Brought in by Gray, he worked with him in complete harmony for 23 years. The two men made another of the splendid teams that mark the Company's history.

When Kunhardt became president in 1929 he was 60 years of age. In his short term of four years, ended by death in September, 1933, he faced and successfully met problems such as no executive had seen since the panic of 1873 in Edward E. Manton's day. For Kunhardt's four years were those of national depression, and a financial collapse in which as one indication the Dow-Jones average fell from 381 in 1929 to a little over 41 in 1932. Yet through that trying period the Company's financial strength was so well maintained, its dependability so amply evident, that in those four years the member-risks insured rose 12 per cent—from 3,928 in 1929 to 4,417 in 1932. And the cost of insurance to members never reached 2½ cents per \$100.

In April of 1934, Marshall B. Dalton took office as the seventh president of the Boston Manufacturers Mutual. Born in Portland, Maine, in 1893, he was 41 at the time of his election—the youngest man to hold the office during the Company's full century. He was also a graduate of the Massachusetts Institute of Technology, and the third president of the Company to hold an engineering degree. The Dalton forebear, Deacon Philemon Dalton, had come to America on the good ship *Increase* in 1635, and a year later (with his wife

and five-year-old son) had been a pioneer settler of the town of Dedham, Massachusetts—the same Dedham in which James Read two centuries later was to take charge of his first cotton mill and thus begin the line of interest that led to the founding of the Boston Manufacturers Mutual. Deacon Philemon, moreover, was by occupation a linen-weaver—a curious touch of textile background for Marshall B. Dalton, in keeping with the Company's own.

His personal background held further interest in that his professional life had been spent in a new field of insurance, a field almost wholly Twentieth Century in its development—the field of liability and casualty insurance that had come with the progress of workmen's compensation laws, and the Age of the Automobile. Graduating from the Institute of Technology in 1915 with some youthful thought of specializing in hydraulics, Dalton instead had joined in 1916 the Liberty Mutual Insurance Company which had been organized just four years earlier. First serving as inspector and loss prevention engineer in the Philadelphia district, he had become assistant manager and underwriter for that district when in 1921 he was transferred to Pittsburgh as resident manager. From Pittsburgh he had come to Boston in 1925, as manager for Liberty Mutual of the entire New England district—whose organization as an operating unit was part of his new responsibility. Five years later, in 1930, he was made vice-president.

Thus eighteen active years of experience were behind him when in 1934 he came to the Boston Manufacturers Mutual. He brought with him the fresh vigor of a new field whose development had recapitulated, with amazing speed, the longer evolution of Factory Mutual work. That latter aspect made the transition from one field to the other very logical. As expressed by S. Bruce Black, himself a builder and devel-



L. HENRY KUNHARDT

President, 1929-1933

Vice-President, 1906-1929





MARSHALL B. DALTON

President, 1934-

oper of the younger form of insurance, the two fields had “one basic purpose: . . . to prevent loss, by research, by field work, by leadership; to learn the causes of loss and how to remove those causes; and to help policyholders do the things which would prevent loss.”

The years since 1934 have been marked by war, by catastrophe, by business and industrial problems of a nature and magnitude unprecedented thus far in this or any other century. Those years have demanded flexibility, alertness, resilience—qualities not commonly associated with age. But age in a great engineering organization, such as the Boston Manufacturers Mutual, cannot be judged as age in a man. The “slipper’d pantaloons; the shrunk shank; the sans teeth, sans eyes,” of which Shakespeare wrote have no application to the increasing number of vigorous and growing century-old corporations in North America today. There is indeed no real parallel in nature—the parallel seems more nearly with the life-stream itself, constantly renewed and strengthened with the steady inpouring of forceful youth from each new generation.

From that point of view, the years since 1934 have proven the Boston Manufacturers Mutual, and the Factory Mutual brotherhood, not old but young. The aftermath of a great depression, the tremendous impact of a great war and subsequent readjustment and inflation; an industrial expansion setting new records in employment, production, and technological advance—all such changes, and their accompanying hazards, have been met with the alertness and flexibility of youth . . . reinforced by the tested principles evolved in a century of sound growth.

It is a far cry from the Boston of 1850 to the Boston of today—or from the America of the same period, and now. It

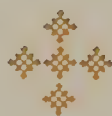
is also far, in many ways, from the Boston Manufacturers Mutual of 1850 to the same Company today. The volume of business in the first year of its century was large for that day—about 3 millions of dollars. The volume for 1949 was 5.9 billions—nearly two thousand times greater. Moreover, as shown in the Appendix statement that follows this chapter, the policy of 1850 covered against fire damage only—while today, at one cost, the policy covers not only fire but also damage from lightning, sprinkler leakage, wind and hail . . . and many other protective extensions, of value to industry. It is a coverage so much broader as to make true statistical comparison impossible.

Yet in spite of that great spread of protection, and of a field that has widened through the century from New England to the whole of North America, and from textile mills to almost every major industry developed during a century of the greatest industrial progress the world has ever seen—in spite of all that, the 1949 loss record of the Boston Manufacturers Mutual was less than 2 cents for each \$100 of insurance in force. Further, in the country as a whole, the two preceding years had been marked by disasters resulting each year in the highest fire loss record ever known. And again it is significant that in those two years the highest loss figure of the Boston Manufacturers Mutual varied only about 3 cents from the low figure of 1949—with an average over the three years that was only 1½ cents greater than the 1949 low. A century's growth in loss prevention know-how made that record possible.

In 1849, the year when James Read in the Temple Club was planning to form the Company, a French writer gave words to a thought that has lived: "The more it changes, the more it is the same." The Boston Manufacturers Mutual, born of New England's textile industry and, particularly, of the fa-

mous “Waltham system,” has spread like so many good things of New England birth to all industry and to all of North America. But still its service is to manufacturers mainly, still its effort is to conserve resources—by preventing loss, by lowering vital costs; by avoiding interrupted operation, and uncertainty in planning and long-range execution. With its Factory Mutual brothers, it is a vital stabilizing force for industrial security whose record cannot be matched. “The more it changes”—with the times and need—“the more it is the same.”

Today—and in the future, as the Company’s first century so surely proves—the unconsciously prophetic words of the old minute-book entry of 1850 still hold good. Today, and tomorrow, the Boston Manufacturers Mutual “can be depended upon at any time.”



APPENDIX

A CENTURY OF GROWTH IN COVERAGE – 1

What was covered, *at one cost*,
by a Boston Manufacturers Mutual policy in 1850:

Loss or damage from

Fire only



A CENTURY OF GROWTH IN COVERAGE — 2

What is covered, *at one cost*,
by a Boston Manufacturers Mutual policy in 1950:

Loss or damage from:

Fire

Lightning

Sprinkler leakage

Windstorm and hail

Many types of Explosion

Impact of airplanes, trucks
and other vehicles

Riot, civil commotion, malicious
mischief, and vandalism

Smoke from faulty operation of furnaces

The above shows merely the major extensions. The broadening of one-cost coverage began more than a half century ago; from 1920 to 1950 alone, there were 82 specific extensions of coverage to benefit policyholders. The Factory Mutual system has steadily pioneered in making insurance broad, simple and non-technical, in coverage.

EDWARD ATKINSON

(1827 - 1905)

*Patron of Engineering Science
and
Benefactor of Industry*

My fellow members of Newcomen:*

Among the treasures of the Massachusetts Historical Society is a collection of papers and books that represent the life, the mind, the varied interests, of Edward Atkinson of Boston. It is an impressive collection. It includes, for example, some 78 volumes of old-time letterbooks containing more than 50,000 pages of the flimsy letter-copies characteristic of such books. There are also more than 20,000 letter-originals, relics of a worldwide correspondence, and more than 250 closely printed pamphlets that add up probably to another 5,000 pages. Just those statistics of his literary remains well illustrate how active was the mind of Edward Atkinson. Also how unusually articulate. And they make it unnecessary more than to mention the real difficulty in summarizing such a mind in an address as brief as this must be.

Edward Atkinson's mind was not only active, it was also wide-ranging and he spoke and wrote on topics and interests as varied as his output was voluminous. But in any review of his life, and the work of his mind, three things stand out. First, his innate predilection toward engineering science and his unqualified admiration of the professional engineer—though he lacked all professional training himself. Second, the benefit he conferred on American industry in developing as an aid to management a vital branch of industrial engineering. Third, his life remarkably illustrates how a man can unconsciously be guided and prepared for a career in which his varied talents can fuse, so to speak, and give his work in that final career a unity, a drive, and an influence still important today—45 years after his death. Edward Atkinson's long life stretched over 78 years, and his connection with American industry covered almost 60 years. But it is the career he found in the last 28 years of his life that justifies my being here tonight.

* An address delivered by Marshall B. Dalton before the Newcomen Society in North America, at the meeting in Boston, Massachusetts, March 23, 1950.

To properly evaluate the man and that final career, we need to know something of the life-road he travelled. He was born in Brookline, Massachusetts, in 1827. His father was a Boston merchant, senior member of the firm of Atkinson and Rollins, whose ships sailed to India, to China, and also on that odd triangular Baltic trade in which Yankee goods were carried from Boston to Cuba—to be sold and replaced by Cuban sugar. With the sugar the ship then sailed across the Atlantic and through the North and Baltic Seas to Riga and St. Petersburg where the sugar was exchanged for Russian hemp and Baltic iron—a cargo that was then brought back to Boston and sold to American shipbuilders. That, incidentally, may explain why in Boston almost to the Civil War the word “merchant” still carried the meaning given by old Dr. Samuel Johnson as “one who trafficks to remote countries.” Boston boys then cut their business eyeteeth in such “traffick,” and Edward Atkinson took advantage of one sailing voyage to India made by one of his father’s ships. He was about 10 or 11; years later he thus described his “trafficking”:

“My first business speculation was putting a dollar into the hands of John Storey who went from my father’s counting room out to Calcutta as supercargo. I commissioned him to buy me Indian bamboo arrows, of which he brought me home (from India) one hundred. . . . I kept a dozen myself out of the hundred arrows that cost a cent apiece, and sold the rest for ten cents each—a very good speculation for a boy.”

Young Atkinson’s boyhood and schooling were typical of the son of a Boston merchant, except in one respect—for some reason he was never sent to the noted Boston Latin School and thus escaped its rigors. Instead, after the family moved from Brookline back to Boston and a home on Mt. Vernon Street, he was sent to a private school located near the site of the present Parker House. He played marbles on the Common, chased with schoolmates over walls and fences along Temple Place, and on Sundays sat decorously in famous old Brattle Street Church where one of his Sunday School teachers was a veteran of the Boston Tea Party of 1773 whose story young Atkinson thus heard at first hand. That pleasant boyhood and schooling ended abruptly when in 1842 his father’s firm became financially embarrassed and it was necessary for young Edward to go to work. He was then just 15. Many years later he set down in these words his equipment:

“What did I get out of school? A good handwriting, on which my father placed great importance, being himself the master of a beautiful hand. A good training in arithmetic, coupled with a right training in inscribing figures in columns for convenient computations, a matter which now seems to me (in 1903) very much neglected. I learned to make columns distinct and separate, each figure in its proper place, and to bring them straight down in the middle of a folio sheet, so that there would be scarcely any variation in the distance from one margin or the other. None who have not later been obliged to get their living by keeping books can begin to understand the importance of method, not only in teaching mathematics but in inscribing figures.”

Such was the lad who was to grow into the man who—uncolleged—was to receive an honorary LL.D. (University of South Carolina), a Ph.D. (Dartmouth), and an honorary membership in the Harvard Chapter of Phi Beta Kappa.

By one of those strange coincidences so frequent in life, Atkinson's first employer was James Read—a distinguished Boston merchant who was later to found the Boston Manufacturers Mutual Fire Insurance Company, the Company that Atkinson himself was to head during the last 28 years of his life and the Company in whose service and growth Atkinson was to find his ultimate career. But in 1842 the Boston Manufacturers Mutual was still eight years in the future, and young Atkinson was simply another green apprentice who after the fashion of the day got up at dawn, opened the store, swept the lofts, got the counting room ready, and then went home for breakfast. After breakfast came errands, the packing and unpacking of merchandise, and all the “generally useful” things that a boy had to do around an old-time commission store. It was a day that ended with dusk, and the putting up of the shutters over the windows—and the pay was \$50 a year, with a raise to \$100 after the first two years. Such were the customary hours, such the pay, in those days; James Read, in fact, was an unusually generous and kindly employer who surprised young Atkinson on his 18th birthday by the gift of an extra \$100 and a special vacation that gave the boy his first chance to travel—to Niagara Falls. It was, by all modern standards, a stern training—and stern pay—but it certainly weeded out the faint-hearts, and it certainly bred men. Atkinson looked back on that training under Read with gratitude throughout all his life. In his own words,

Atkinson once described Read as "friend and adviser as long as he (Read) lived." Atkinson was fortunate in his first employer.

Atkinson spent almost six years in the Read store and then left—ambitious to try another line of work and, especially, to realize an ambition to be a salesman, but he was temperamentally unfitted for that kind of work. When he was 76, he summarized his failure and disappointment at 21 in these words:

"I passed from one occupation to another, seeking to be a salesman, but I wasn't cut out for that. I was made for an accountant, and later for a student of social and financial questions."

One of his apprentice chores at James Read's had been the laborious copying by hand of letters going out to the firm's customers—he later said that the chore taught him "how to conduct a business correspondence." He never had formal training as a bookkeeper but figures drew him, and watching his older brother (who was the Read bookkeeper) he picked up enough knowledge so that he could prepare and analyze an account. That gave him his first opportunity when an important customer suddenly demanded an immediate statement of his account. The regular bookkeeper was sick; Atkinson, volunteering, worked all night on the books and in the morning produced a finished account. The feat naturally made talk; the customer remembered Atkinson and when the latter looked for work after his failure as a salesman, it was this same customer who took him on—the well-known commission firm of J. C. Howe and Company. First trying out Atkinson as a bookkeeper, they soon began using him as an accountant troubleshooter in the books of the various cotton mills they controlled. By 1851 he had so gained the firm's confidence that he was made treasurer of his first cotton mill. He was then 24 years of age.

Soon after this he drew the attention of Benjamin E. Bates, the Boston man who developed the great textile mills at Lewiston, Maine, and for whom Bates College is named. Serving Bates as a special financial assistant, and still maintaining his Howe connection, the young Atkinson had plenty of activity and experience. His ability was harshly tested in the great financial panic of 1857, but he came through intact. By 1858, when he was 31, he could write to a friend that he had straightened out the books and finances of nine cotton corporations and was serving as treasurer or assistant treasurer of six. By 1861, when Fort Sumter was fired

on, Atkinson had an excellent background of firsthand familiarity with all phases and problems of cotton textile financing, including that of supply. So far had his first asset—the natural turn for figures—served him. Now came the time when his second asset—his gift of articulate expression—was to stand him in good stead. Here again his development had been self-taught, and voluntary.

Back in 1848, when he was 21 and a failure as a salesman, Atkinson wrote a friend that he had cast his first presidential ballot for the new Free-Soil party. He also added, "I am becoming a good deal of a Parkerite. I don't like the name but cannot think of any other." Theodore Parker was the remarkably learned, remarkably articulate Boston minister who drew each Sunday an audience of 3,000 people. He was a very dominant figure in the liberal thought of Boston in the years preceding the War Between the States. It is possible that young Atkinson would have needed no stirring to public activity and public expression, but the influence of Theodore Parker was certainly a stimulant. As was also the temper of Boston, in those days a century behind us. There have been many books written over Boston's great literary flowering of the 1850s and 1860s, but it has been forgotten or ignored that other aspects of Boston then showed the same remarkable spirit. The amazing growth (so little noticed, even by Boston historians) was then under way—a physical growth in which hills were torn down, ponds, swamps, and estuaries filled, the level of low lands raised (with houses standing on them) until the original 783 acres of the Boston peninsula were increased to a total of 1,829 acres of solid land . . . including that remarkable development we call Back Bay.

That was the Boston that built nearly 3,000 miles of early railroads before it turned West to build the Michigan Central and help make Chicago a railroad center. That was the Boston that backed John Brown in Kansas; the Boston whose aroused feeling grew into wrath at the notorious Fugitive Slave Law, and eventually made it a very dead law indeed. And finally, though I could give many other illustrations, that was the Boston whose business men in 1844 cut through the solid ice of the Bay a channel seven miles long—merely to allow an early side-wheel ocean steamer to sail for England on time. That is a Boston hard to realize today, but it is the Boston that must be understood as the influence and background behind the enthusiasm and force displayed by Edward Atkinson in any cause that he felt had public significance, and thus enlisted his active mind.

He was 27 years old when Boston seethed over the Anthony Burns case in 1854, and it cost the government \$100,000 to return one fugitive slave from Boston to the South. Atkinson was part of that seething, a member of the audiences in Faneuil Hall, and a volunteer helper of Richard A. Dana, Jr., in the latter's bitter legal fight for the unfortunate Burns. Next Atkinson was active as an aide to Amos A. Lawrence in raising money for the famous New England Emigrant Aid Society that shipped rifles (under the nickname of "Beecher Bibles") to John Brown and his mates in the struggle for "Bleeding Kansas." Working in these movements, young Atkinson began to write letters and articles for the newspapers of Boston and thus unconsciously trained himself for his next new role—that of pamphleteer.

The outbreak of the war, in 1861, found many earnest men troubled over what might be the economic consequences of any termination of slavery. Southern sympathizers, in fact, argued that without slavery the negro would not work, cotton could not be grown economically, and the whole cotton textile development of the country would be ruined. Certainly that argument seems silly to us today, after 80 years of growing cotton by free labor, but in 1861 that particular aspect of slavery held all the terror and mystery of a future unknown. Therefore the eagerness with which Northern men welcomed a 52-page pamphlet that Atkinson issued in the Fall of 1861, boldly meeting the Southern argument and refuting it by a wide range of statistics and historical illustrations. The title of the pamphlet is self-explanatory: "Cheap Cotton by Free Labor." It was widely quoted; it opened to Atkinson the columns of Horace Greeley's *New York Tribune*, then the most influential newspaper in the country. It made Atkinson known in England, where the friends of the North welcomed the pamphlet as a help in meeting Southern claims that England's cotton industry would also be injured if slavery were ended in the South. Atkinson was then 34; his two gifts—a turn for figures, a gift of articulate expression—had begun to mesh.

This is not the time or place to deal with Atkinson's public activities, except for the influence upon his development and his later career. By 1862 he was appearing in the *Atlantic Monthly*; in 1863 Charles Eliot Norton was asking him to write for the *North American Review*; in 1864 he was travelling to Washington with the great war governor of Massachusetts, John A. Andrew, as an expert on the cotton trade and a man with important views on

taxation and government finance. It was then he first met Abraham Lincoln: "I had," wrote Atkinson to his wife, "half an hour's close attention from the President himself; he is studying the cotton problem . . . and listened to my ideas with great interest." Such was Atkinson's growth in stature during the war years, and it is significant that Henry Adams singled him out for mention in the famous "Education." Writing of his return to this country in 1868, after the trying years spent in the American Embassy in London, Henry Adams said:

"At the end of three months (in this country), the only person among the hundreds he (Adams) had met, who had offered him a word of encouragement or had shown a sign of acquaintance with his doings, was Edward Atkinson."

Decidedly Atkinson was not a man whose name faded out with the close of the war. In 1863 John M. Forbes had organized the notable New England Loyal Publication Society, an interesting venture in widespread communication and a striking forerunner of the modern newspaper syndicate. Atkinson had been a member of the executive board; many of his letters and articles had been distributed by the Society to newspapers throughout the country, and even abroad. Editors were familiar with his name; they picked up for quotation or comment the new letters, articles and pamphlets that he continued to write. From cotton he moved on to tariff reform, to sound currency and other postwar problems. By 1878 the man who thirty years earlier had sadly concluded he "wasn't cut out for a salesman," had unconsciously trained and established himself as a master salesman—but of ideas, not goods. And all the splendid qualities of that active, receptive mind; its self-taught skill in the presentation of ideas, in the technique of statistics, the art of persuasion, were now to find their greatest and most enduring use.

When in January, 1878, Edward Atkinson became president of the Boston Manufacturers Mutual Fire Insurance Company, it was quite literally one of those rare cases where the man, the place, and the time, all coincide. The Company had been founded in 1850 by Atkinson's early employer, James Read. It was the first mutual fire insurance company of manufacturers in Massachusetts—and it is still the oldest, celebrating its centennial of service to industry this year. It was the third such company in the

whole United States, two other companies having been started in Providence, Rhode Island, where the idea of manufacturers mutual fire insurance had originated in 1835. Why that remarkable system of insurance was begun and developed almost wholly among textile manufacturers is partly explained by Edward Atkinson's own story of a happening of 1851, long before he ever dreamed of being an insurance executive. As you will recall, that was the year in which he became treasurer of his first mill; he went out to place its fire insurance among the companies of Boston. Writing in the third person, Atkinson thus set down his experience:

"The writer went into one of the principal insurance offices . . . to make application for insurance. The President received him with great politeness, and in answer to the question "Do you insure first-class cotton mills?" answered promptly, "O yes sir, to any extent." The writer then proceeded to describe the mill but was interrupted by the question, "Did you expect us to insure you *against* fire? If so we shall have to decline; our office can only insure that your mill *will* burn."

Other cotton and woolen manufacturers had similar experiences, and deeply resented that attitude. They also resented the excessive rates they were made to pay—rates that invariably were advanced in periods of depression, or after great city conflagrations in which no textile mills were involved. The founders of the Boston Manufacturers Mutual, and the other companies of the Factory Mutual System, were able men, careful men, proud men. Particularly they were proud of maintaining and operating first-class mills, and they could see no reason why in spite of their care and ability their mills should be lumped with the general run of insured properties—nor why *they* should be penalized for fire losses originating in dishonesty, in carelessness, and lack of foresight, utterly foreign to them. It is significant that when the Boston Manufacturers Mutual was founded, the years 1848 and 1849 had been years of depression and advancing insurance rates. The year 1835, when the Factory Mutual system originated, had a similar story. Thus the resentment of the textile men had a firm basis, and the history of more than a century has certainly proved their point. Because they knew the hazards of textile manufacturing as no early insurance executive did, and because textiles were then the outstanding branch of manufacturing in New England, the first manufacturers mutuals (or Factory Mutuals, as they are now called) were formed by and of textile men, and largely limited in member-

ship to the first-class mills. The point they proved may be illustrated in one way by this: When the Boston Manufacturers Mutual Fire Insurance Company was formed in 1850, the fire insurance rate on a cotton mill varied from \$1.25 to \$1.75 per \$100 of insurance—where insurance could be gotten. By 1855, when Edward Atkinson attended his first Company meeting, the insurance cost to its members had already been brought down to 38¢ per \$100. And when Atkinson's connection with the Company was finally severed by death, fifty years later, the net cost of insurance for the members of the Boston Manufacturers Mutual had been skillfully driven down to only 6½¢ per \$100 of insurance.

Atkinson was 28 years old when he attended his first Company meeting. He was 38 when, in 1865, he was elected a director—the youngest man on the Board. The Company was then entering upon that period, so inevitable in long-lived companies, in which the founding generation is passing and a new generation takes over. In 1870 James Read, the founder, died; by 1878 the remainder of Atkinson's fellow directors of 1865 had died or retired—leaving him the senior member of the Board in experience and years of service. That change, from youngest director to senior director, had taken 13 years. And Atkinson was just 51.

His predecessor as president had been Edward E. Manton who had resigned at 73 in ill health, and had died almost within a month of his resignation. He was not an engineer by training, but a self-taught practical millman who had operated his own small cotton factory before 1835. He had originally become a factory mutual executive in 1850, and had proven such a gifted fire insurance underwriter that he had built up the Boston Manufacturers Mutual through the turbulent conditions of war, and through the great depressions of 1857 and 1873—all without even a temporary setback.

Manton's ability was so commanding, his influence and leadership so great, that during his regime the whole factory mutual system was known in Boston insurance circles as "the Manton Mutuals." Such a man is not easy to succeed. Atkinson was neither engineer nor practical millman; his training had been that of an accountant and office administrator. He had no knowledge of insurance underwriting, other than what little he could have picked up by listening to Manton during the infrequent Board meetings which were held only about once a year—so great was Manton's competence and the justified trust of the directors in him. Certainly Atkinson, in 1878, was the mere amateur by comparison with Edward E. Manton. But it so happened that Atkinson's seeming defects were to prove vir-

tues; actual assets to the Company, to the Factory Mutual system, and to industry as a whole. As I said earlier, it was the coming together of the place, the man . . . and the time.

For the year 1878 saw American industry definitely emerging from the cycle of severe depression which had begun in 1873. The industrial record of the preceding five years has been well summarized by the historian, James Ford Rhodes, as “a long dismal tale of declining markets, exhaustion of capital . . . constant bankruptcies, idle mills . . . depression and despair.” In such a period there is always technological advance in American industry. Hard times, poor markets, make manufacturers and executives much more quick to try new things—if they promise to cut costs, and bring new or wider markets within reach. And technological advance in industry invariably brings in new fire hazards due to new chemicals, new materials, new short-cuts in manufacture. The age of steel had begun only 12 years before, with the settling of the Bessemer patents in 1866. The first oil well had been driven in 1859—less than 20 years before. The electric light was just beginning. It is no mere coincidence that the Massachusetts Institute of Technology began its work in 1865; William B. Rogers, the founder, had surely sensed that the day of the self-taught practical man in industry was coming to an end, and the day of the engineer was dawning. How badly the engineer and the technical laboratory were needed, you may judge from a committee of fire underwriters (not Boston Manufacturers) who in 1867 solemnly considered the fire hazards of those then new-fangled things, “Benzine and Gasoleine” (the spelling is actual). Their report ran:

“The committee is satisfied that there is no danger of explosion taking place from the burning of the materials referred to, even if fire should be communicated to them.”

That investigation must have consisted in asking questions of a salesman. But Edward Atkinson did not work that way.

Speaking of Atkinson before the American Academy of Arts and Sciences, Thomas Wentworth Higginson once said that “no college training could possibly have added to his power of accumulating knowledge, or his wealth in expressing it.” Atkinson’s first moves as president of the Boston Manufacturers Mutual are pertinent to that statement. He found the Company’s books in perfect condition, but his statistical mind wanted more than financial statements. With long experience, and a splendid memory, his predecessor (Manton)

had not needed to keep more than the barest record of underwriting. Lacking experience, Atkinson needed some guide; characteristically he set out to find it in statistics. He set clerks at the Company's accumulated policy books, he sought details of fires and losses through the 27 years that the Company had then experienced. Within a month he had compiled an experience table, and an immediate discovery from that table set him into action. That table showed that the three leading causes of fires through the 27 years had been broken lanterns (carried then by watchmen), spontaneous combustion, and friction.

An unbreakable watchman's lantern was a mechanical problem that a lantern manufacturer solved. But spontaneous combustion and friction were more difficult questions. He found suspicion that vapor fumes from the lubricating oil used on machine bearings had been responsible for the unusual destructiveness of a recent mill fire. With this in mind, Atkinson gathered figures from 150 mills as to the lubricants used, their costs and efficiency. To his surprise there was a wide variance both in the oils used and in the cost of oils per pound of manufactured goods. He tabulated the figures, distributed them among selected mill managers and asked for comment or explanation of the variance shown. As he later said, after the returns were in:

"The conclusion reached by all was that each knew little about the subject, while the rest (of the industry) knew less, and I concluded for myself that I knew nothing and that it was time to bring lubrication to a science if that were possible."

His next step was one that genuinely broke with tradition, and in it he pioneered for American industry in what we now accept almost as commonplace—industrial research. He carried his problems of oils to the Massachusetts Institute of Technology, then in operation about 13 years. The project was so new that Professor John M. Ordway, who handled the tests, had to invent his own apparatus. But the immediate results were so striking that within three months Atkinson had arranged to have Ordway give his findings to the New England Cotton Manufacturers' Association for the benefit of the entire industry. Nor did Atkinson stop there. He saw to it that Professor Ordway was financed in further research that lasted some five years and set up standards for all oils—both illuminating and lubricant—that revolutionized their manufacture, commercial handling, and industrial use.

It would be tedious to even list the great number and variety of the industrial improvements in which Edward Atkinson was an inspirer and leader. Perhaps the most striking work he did was in connection with automatic sprinklers. He did not invent automatic sprinklers but he took them in hand at an early stage, set up research to develop and perfect them, publicized them, fought for them, crusaded for them so vigorously that there is record of one exasperated mill-owner advising that Atkinson be sure to take a sprinkler with him when he died . . . and went to where a sprinkler would help protect him! And all the while even experienced, but visionless, fire underwriters were asking him incredulously: "Do you really expect to put out a mill fire with a watering pot?"

But Atkinson, as you know, had the last word—and it was a good word for American industry. Within five years so many members of the Boston Manufacturers Mutual had equipped their mills with automatic sprinklers that it was possible to foresee the time when all Factory Mutual risks would be so protected. At the end of 10 years he had accumulated more of his beloved and effective statistics—statistics based upon his careful record of almost one thousand fires. Of those fires a total of 759 had occurred in mills not equipped with sprinklers, and the average insurance loss on those unequipped mills had been over \$17,000. But the 206 fires in sprinklered mills had been so controlled that the insurance loss barely touched an average of \$1,000. The "watering pots" worked!

I do not need to argue that in all that great work Edward Atkinson was a true benefactor of American industry. The tremendous responsibility put upon the automatic sprinkler in our huge industrial plants is reminder enough. The thing of interest to us tonight is the viewpoint from which the man worked. His statistics proved to him that something like 90 per cent of all fires were the result of lack of knowledge, foresight or care—and thus were sheer waste; destructive of money, materials and human effort. Against waste he crusaded all his long life, and perhaps never more significantly than in his part in the founding and early support of the Massachusetts Institute of Technology. Back in 1861, when he was only 34, he appeared with Professor William B. Rogers before a committee of the Massachusetts Legislature to argue for a grant of land on which to build the Institute School. As he later wrote:

"I then testified to the Committee that I had witnessed a waste, and had shared in part in such waste, in the conduct of manu-

facturing in Massachusetts, due to want of exact knowledge and of applied science . . . more than sufficient to have endowed an Institute of Technology in every county in the State."

That grant, as we know, was made; the school was built and began operating in 1865, and Atkinson was staunch in his support and in aiding its teachers and employing its graduates. He staffed the Boston Manufacturers Mutual with trained engineers and he unquestionably created an entirely new field for the graduates of our technical schools—that of loss prevention engineering.

Similarly he left his impress upon American architecture in his articulate insistence upon safety, and in his development and publicizing of standards of fire-resisting and fire-blocking design that today are accepted architectural practice not only in mills but in public buildings, hospitals, churches, and schools. His record in aid to American industry I have already indicated in part. Any man helps industry who through technical advance cuts costs and makes wider markets possible. The automatic sprinkler and other fire protective, loss preventive, devices that Edward Atkinson worked with inventors and engineers to perfect, and then promoted to industry in a way that would not have been possible without his help—such things not only drastically cut one basic cost (that of insurance) but went further, through their great reduction in the number of destructive fires, to make production more regular, employment more steady, and management more confident in planning and carrying out the tremendous concentrations of men, materials and machines under one roof, so characteristic and vital in American industry today.

And he did it all as an avowed amateur. I quote his own final words:

"Having no truly scientific mastery of any of the applied sciences, it has been my function to select the men who might each in his own branch of science work out the problems as they have been presented. To them is due the larger part of the benefits which have ensued."

Fellow members of Newcomen, American industry and American engineering could even today use with great benefit a few more amateurs such as Edward Atkinson.

LETTER FROM ZACHARIAH ALLEN

TO JAMES READ

Providence, Sept. 29, 1849

JAMES READ, ESQ.

Dear Sir:

I am informed by Mr. Hughes, agent of the Rhode Island Mutual Fire Insurance Company, that you expressed an interest in extending the system of mutual insurance as a check to any further advance of rates of premiums by the cash offices. It was in consequence of the advance of premiums by these offices that this new institution for insurance was established.

About fourteen years ago I was instrumental in establishing the Manufacturers Mutual Fire Insurance Company, and feel emboldened by the successful result of this experiment by which an average saving of fifty-three per cent of the premiums charged by the cash offices has been effected during this period of time. With the advantages of the recent improvements in the more secure construction of modern mills, of more secure modes of warming them, of regular watching, and of more efficient force-pumps, there is little doubt but that a superior result of economy of insurance is still obtainable, provided due diligence be exercised in selecting the first class of risks.

The above result appears to demonstrate that the rates of premium charged by the cash offices in Boston and Providence are actually too high. To make up for third-rate risks, on which the premiums are too low, the careful and prudent owners of cotton establishments are stripped of the advantage of a lower rate of insurance to which they are justly entitled. The remedy for this evil is in the hands of the proprietors of cotton mills, if they will determine to exercise their intelligence by the establishment of mutual insurance offices in which *only the first class of cotton mills shall be insured*. As the amount taken on any one risk is commonly limited to about fifteen thousand dollars, and as modern cotton mills now rarely cost less than one hundred thousand dollars, and many of them thrice this sum, it is manifest that several mutual offices are requisite to divide the risks.

My first impression was favorable to the establishment of a single office to take \$30,000 risks; but on examining the subject I became

satisfied that it is better to enlist a double number of efficient inspectors of the mills and to render available the personal knowledge of the risks which a greater number of directors will combine.

The additional expense, therefore, so far from being an objection, is essential to success.

Impressed with a conviction of the advantages that may be derived from carrying into effect a general system of the kind delineated, I take the liberty of respectfully urging upon the attention of the proprietors of the many well-regulated cotton mills in the vicinity of Boston the importance of proceeding forthwith to establish a mutual insurance company for taking risks on the first-class of cotton mills.

As the profits of the cotton manufacturers are probably destined to be small for some time to come, from the great increase of the number of them in this country, the economy as well as the justice of the proposed plan commends it to the attention of the proprietors of cotton mills.

A mutual insurance office established in the city of Boston would be resorted to by the proprietors of mills in Rhode Island, the amount of whose risks are too large to be embraced within the restricted limits of the two mutual insurance offices now established in Rhode Island, which offices would serve to refer to the Boston office any surplus which they could not take; and a reciprocal result would take place in regard to applications of the Boston office.

Thus a reciprocity of interests would necessarily establish a communication of intelligence between the offices, such as now exists between the two mutual offices in this city, without the least danger of interruption by adverse interests, the common object being a reduction of insurance premiums to the actual cost on the best cotton mill establishments in New England, and thus a very excellent system of mutual insurance might be instituted, and of mutual surveillance to check carelessness for the common benefit. Should the preceding suggestions meet your views, and those of other gentlemen in Boston, I should be pleased to hear from you and to offer any co-operation in our power to aid in the outset, of your organizing a Mutual Fire Insurance Company in Boston.

I remain yours, with sincere respect

Z. ALLEN

MILL CONSTRUCTION STANDARD, 1856

PREPARED BY

JOHN L. HUGHES

“I will indicate the rate of premium which I think a Cotton Factory should bear, built of Stone or Brick; with a slated or metal roof; or with shingles laid in cement.

“Having a suitable Fire Apparatus, with a proper supply of full pails of water distributed over the Factory.

“With Elevators bricked up and furnished with iron doors; or the Elevators cased with one and a half inch plank and furnished with perpendicular sliding doors, and all to be painted with a heavy coat of fire proof paint; or to be tinned on the outside.

“With Steam Pipes to be introduced, and Sprinklers wherever deemed to be necessary.

“Ladders, those that are permanently attached to the Factory building, to have suitable platforms and railing to protect those who may be called to go upon them in case of a fire; a supply of movable ladders to be furnished.

“The premium (on such a factory) to be nine tenths of one per cent.

“For Factories not thus provided, the premium to be one per cent or more.”

March 21, 1856

J. L. HUGHES

MILL CONSTRUCTION STANDARD, 1858

PREPARED BY

EDWARD E. MANTON

In compliance with the vote passed at the meeting of the Board of Directors Monday October 4th, 1858, the Secretary Respectfully Reports the following description of a cotton or woolen mill that may be insured at 8/10 per cent per annum: *

“The Building should be built of brick or stone with solid walls inside, stone caps and sills, brick or stone or metal jet and cornice.

“Roof covered with metal or slate.

“Well fitted lightning rods.

“Plank floors with board on top, and ceiled or plastered on the underside; would be much safer with mortar between the floors.

“Attic or upper story finished by plastering on the roof boards between the rafters, or planing and painting, or whitewashing the inside of roof boards and rafters.

“The stairways in one or more projections built of brick or stone.

“The elevators in the porch, or if in the rooms, should be closed by a self-closing hatch.

“Wash rooms, when projecting from the Mill, built of brick or stone.

“No openings in the floors from room to room.

* At the time this standard was prepared the lowest rate of premium deposit was 90 cents per \$100—or as then expressed, 9/10 per cent per annum. The standard therefore represents the ideal of construction and protection toward which Manton was working, to bring greater safety and a further lowering of cost.

“Furnished with good force pumps connected to the Water Wheels, or pipes from a reservoir of sufficient head and size to protect all parts of the building.

“Fixed ladders and platforms at each story and at least one iron pipe at a fixed ladder with hydrant at each story, and also in the porch or wash room.

“Casks of water and pails to each story, particularly pails of water in the window of Carding room.

“The fire apparatus should be equal in power to, at least, one good force pump to every 5000 Spindles.

“The building should be warmed by steam and all dressing of yarn, making sizing, or coloring, done by steam heat.

“The boiler should be outside the mill, and chimney separate from the walls of the Mill.

“Iron pipes should be fitted to admit steam into each room of the Mill in case of fire, and all pipes for warming the Mill should not be in close contact with wood work—and all pipes should be kept clear of cotton or wool stock and waste.

“Gas light should be used, and the gas works so situated as not to endanger the Mill Building.

“The picking should be performed in a building separated from the Mill, and connected with the Mill by a passage way of brick, with iron doors at each end, and the room provided with sprinklers, connected with a proper reservoir or with the force pumps; hydrants from the force pump near, and steam pipe from the boiler to use in case of fire.

“A good watch clock, the pins driven in each room each half hour by the night watchman.

“The waste and dirt should be all removed from the Mill each day, before lighting the Mill for evening work,—or in summer, before leaving off work, and the Mill kept in good order at all times.

“The building should not be near enough to any other building to be endangered thereby.”

E. E. MANTON

Acting President . . . 1933-1934
Vice-President . . . 1929-1948
Secretary . . . 1910-1944



H. DWIGHT HALL
Director



OTTO F. HAUCK
Vice-President and Secretary



GILBERT M. RODDY
Treasurer



H. LESTON CARTER
Vice-President



J. FRED REID
Vice-President



WILLIAM K. OUSLEY
Vice-President

BOSTON MANUFACTURERS MUTUAL FIRE
INSURANCE COMPANY

Board of
Directors
1950

- ROBERT AMORY New York, N. Y.
Vice President, Springs Mills, Inc.
- S. BRUCE BLACK Boston, Mass.
President, Liberty Mutual Ins. Co.
President, Liberty Mutual Fire Ins. Co.
- HENRY M. BLISS Boston, Mass.
President & Treasurer, Pacific Mills
- SPENCER BORDEN Providence, R. I.
- JAMES A. BURKE Fall River, Mass.
Treasurer, Sagamore Mfg. Co.
- MARSHALL B. DALTON Boston, Mass.
President of the Company
President, Mutual Boiler and Machinery Insurance Co.
- FREDERIC C. DUMAINE Boston, Mass.
- R. H. I. GODDARD Providence, R. I.
Trustee, Butler Hospital
- H. DWIGHT HALL Winthrop, Mass.
- BERTRAM S. HAWKINS Wellesley, Mass.
- ROGER N. HEALD Worcester, Mass.
Chairman of Board, The Heald Machine Co.
- MILTON P. HIGGINS Worcester, Mass.
President, Norton Company
- RONALD T. LYMAN Boston, Mass.
Trustee
- M. LESTER MADDEN Boston, Mass.
Chairman of Board, Hollingsworth & Whitney Co.
- ALBERT G. MASON Milton, Mass.
- JOSEPH K. MILLIKEN North Dighton, Mass.
Treasurer, Mount Hope Finishing Co.
- PHILIP M. MORGAN Worcester, Mass.
President, Morgan Construction Co.
- EVERETT MORSS Cambridge, Mass.
President & Treasurer, Simplex Wire & Cable Co.
- BRACKETT PARSONS Boston, Mass.
President, Pepperell Manufacturing Co.
- JAMES DUNCAN PHILLIPS Boston, Mass.
Director, Houghton, Mifflin Co.
- ARTHUR H. QUIGLEY Waterbury, Conn.
President, The American Brass Company
- WILLIAM T. READ New Bedford, Mass.

- ALDEN REED Worcester, Mass.
Treasurer, Reed & Prince Mfg. Co.
- CARLETON R. RICHMOND Boston, Mass.
President & Treasurer, West Point Mfg. Co.
- RUSSELL G. SCOTT Taunton, Mass.
Treasurer, Reed and Barton Corporation
- MALCOLM B. STONE Boston, Mass.
President, Ludlow Manufacturing & Sales Co.
- E. KENT SWIFT Whitinsville, Mass.
Chairman of Board, Whitin Machine Works
- PAUL WHITIN Northbridge, Mass.
President, Paul Whitin Manufacturing Co.
- WILLIAM WHITING Holyoke, Mass.
President, Whiting Paper Company
- GEORGE E. WILLIAMSON . West Springfield, Mass.
President, Strathmore Paper Company
- JAMES DECAMP WISE New York, N. Y.
President, Bigelow-Sanford Carpet Co., Inc.

REGIONAL ADVISORY BOARDS

Mid-West
Advisory
Board

1950

- HERBERT BECKSTROM Chicago, Ill.
Treasurer, United Drill & Tool Corporation
- JARL H. EDERSTROM Rockford, Ill.
Secretary & Treasurer, Rockford Textile Mills, Inc.
- ROBERT E. FRIEND Milwaukee, Wis.
President, Nordberg Manufacturing Co.
- FRANK HABICHT Buchanan, Mich.
Vice President, Clark Equipment Company
- DUANE T. MOLTHOP Chicago, Ill.
President, Vierling Steel Works
- HERBERT T. RANDALL Hamilton, Ohio
Vice President, The Champion Paper & Fibre Company
- WALTER D. STEELE Des Plaines, Ill.
President, Benjamin Electric Mfg. Company

New York
Advisory
Board

1950

- HARRY L. BAILEY New York, N. Y.
Trustee
- ALBERT H. CROSSMAN Utica, N. Y.
Director, Utica and Mohawk Cotton Mills, Inc.
- PERCIVAL S. HOWE, JR. New York, N. Y.
President, The American Thread Company
- S. INGLIS LESLIE Lyndhurst, N. J.
Chairman of Board, Leslie Co.
- SCHUYLER MERRITT, II New York, N. Y.
Treasurer, McKesson & Robbins, Inc.
- THEOPHIL H. MUELLER New York, N. Y.
President, Julius Kayser & Co.
- GRANT G. SIMMONS New York, N. Y.
President & Treasurer, Simmons Company
- EDWARD F. WESTON Newark, N. J.
*Chairman of Board, Weston Electrical
Instrument Corporation*
- JAMES DECAMP WISE New York, N. Y.
President, Bigelow-Sanford Carpet Co., Inc.

Southern
Advisory
Board

1950

- CLIFFORD B. HAYES Lyman, S. C.
Vice President, Pacific Mills
- DAVID W. HUNTER Rock Hill, S. C.
President & Treasurer, Arcade Cotton Mills
- JOSEPH L. LANIER West Point, Ga.
*Executive Vice President, West Point Manufac-
turing Co.*
- J. HAROLD LINEBERGER Belmont, N. C.
Secretary & Treasurer, Acme Spinning Company
- WALTER REGNERY Joanna, S. C.
President, Joanna Cotton Mills Co.

*Officers
and
Staff
1950*

MARSHALL B. DALTON
President

OTTO F. HAUCK
Vice President and Secretary

H. LESTON CARTER
Vice President

J. FRED REID
Vice President

WILLIAM K. OUSLEY
Vice President

GILBERT M. RODDY
Treasurer

F. WINTHROP HARVEY
Assistant Vice President

GEORGE A. SHATTUCK
Assistant Vice President

HENRY J. NEAL
Assistant Secretary

DAVID G. CAMERON
Assistant Secretary

ROBERT L. JOHNSON
Assistant Treasurer

PAUL G. DICKHAUT
Comptroller

ROBERT R. ELLIOTT
General Counsel

RUTHERFORD HARRIS
Personnel Manager

*Executive
Offices*BOSTON, MASSACHUSETTS

BOSTON, MASS., 60 Batterymarch Street

NORMAN E. HARRIS, *Manager*CARL G. RICHMOND, *Engineer*PERCY E. HARVEY, *Engineer*DALE E. VAN LENTE, *Engineer*PAUL J. HARWOOD, *Engineer**District
Offices*

CHARLOTTE, N. C., 112 So. Tryon Street

HENRY D. WILLARD, *Manager*BERRYMAN E. WOODRUFF, JR., *Engineer*

CHICAGO, ILL., 337 West Madison Street

HAROLD E. TABBERT, *Manager*DONALD L. PASS, *Engineer*

CLEVELAND, OHIO, 401 Euclid Avenue

CHESTER A. RUOFF, JR., *Engineer*RICHARD S. HOWES, *Engineer*

NEW YORK, N. Y., 250 Park Avenue

RICHARD W. NEWCOMB, *Manager*GEORGE H. DYE, *Engineer*PAUL R. THEROUX, *Engineer*

BOSTON MANUFACTURERS MUTUAL FIRE
INSURANCE COMPANY

1850	OFFICERS	1950
*John Aiken	President	1850–1851
*William Amory	President	1851–1865
*Edward E. Manton	President	1865–1878
*Edward Atkinson	President	1878–1905
*Joseph P. Gray	President	1906–1929
*L. Henry Kunhardt	President	1929–1933
H. Dwight Hall	Acting President	1933–1934
†Marshall B. Dalton	President	1934–
*Joseph P. Gray	President Emeritus	1929–1941
*William B. Whiting	Vice President	1875–1894
*C. J. H. Woodbury	Vice President	1888–1895
*Joseph P. Gray	Vice President	1894–1905
*Francis E. Robinson	Vice President	1906–1910
*L. Henry Kunhardt	Vice President	1906–1929
†H. Leston Carter	Vice President	1920–
*J. Waldo Lord	Vice President	1920–1943
H. Dwight Hall	Vice President	1929–1948
†J. Fred Reid	Vice President	1946–
†Otto F. Hauck	Vice President	1948–
†William K. Ousley	Vice President	1948–
*John L. Hughes	Secretary	1850–1857
*Edward E. Manton	Secretary	1857–1865
*William B. Whiting	Secretary	1865–1894
*Francis E. Robinson	Secretary	1894–1910
H. Dwight Hall	Secretary	1910–1944
†Otto F. Hauck	Secretary	1944–
*John L. Hughes	Treasurer	1850–1857
*Edward E. Manton	Treasurer	1857–1878

†Present Officers *Deceased

*Edward Atkinson	Treasurer	1878–1905
*John B. Seward	Treasurer	1906–1920
Edward F. Robinson	Treasurer	1921–1944
Marshall B. Dalton	Treasurer	1944–1946
†Gilbert M. Roddy	Treasurer	1946–
Harry C. Wolf, Jr.	Assistant Vice President	1935–1941
George M. Wile	Assistant Vice President	1946–1948
†F. Winthrop Harvey	Assistant Vice President	1948–
†George A. Shattuck	Assistant Vice President	1948–
*Joseph H. Low	Clerk	1850–1870
*Joseph H. Low	Assistant Secretary	1870–1881
*Roland W. Toppan	Assistant Secretary	1881–1889
*Francis E. Robinson	Assistant Secretary	1889–1895
H. Dwight Hall	Assistant Secretary	1906–1910
Edward F. Robinson	Assistant Secretary	1910–1916
Otto F. Hauck	Assistant Secretary	1916–1944
†F. Winthrop Harvey	Assistant Secretary	1920–
H. Nelson G. Terry	Assistant Secretary	1935–1946
†Henry J. Neal	Assistant Secretary	1938–
*Walter A. Harrington	Assistant Secretary	1946–1946
†David G. Cameron	Assistant Secretary	1948–
*Roland W. Toppan	Assistant Treasurer	1884–1889
*John B. Seward	Assistant Treasurer	1889–1906
Edward F. Robinson	Assistant Treasurer	1910–1919
Edward T. Fillebrown	Assistant Treasurer	1919–1935
*Walter A. Harrington	Assistant Treasurer	1935–1946
Gilbert M. Roddy	Assistant Treasurer	1936–1942
†Robert L. Johnson	Assistant Treasurer	{ 1941–1942
		{ 1946–
Ernest D. Shelley	Assistant Treasurer	1942–1947
Ernest D. Shelley	Comptroller	1946–1947
†Paul G. Dickhaut	Comptroller	1947–

DIRECTORS OF THE FOUR COMPANIES

At the beginning of 1936, four Massachusetts Factory Mutual companies began operating as a group—issuing one policy. They were the Boston Manufacturers Mutual (founded in 1850), the Worcester Manufacturers Mutual (1855), the Fall River Manufacturers Mutual (1870), and the Paper Mill Mutual (1886). The resultant gains in economy and efficiency of operation were so evident that in 1941 the Paper Mill Mutual merged completely with the Boston Manufacturers Mutual, being followed at the close of 1946 by the Worcester and Fall River companies—the Boston Manufacturers Mutual Fire Insurance Company being the continuing Corporation. Hence the divisions shown below.

†Present Directors	YEARS OF SERVICE			
	Boston	Paper Mill	Worcester	Fall River
Aiken, John	1850-1864	.....	.....	.....
Allen, Charles L.....	.....	.....	1920-1940	.....
Amory, Charles B.....	.....	1890-1910	.....	.....
Amory, Charles W.....	1884-1913	.....	.....	.....
Amory, Frederic	1877-1928	.....	.....	.....
Amory, James S.....	1850-1876	.....	.....	.....
†Amory, Robert	1928-	1938-1941	.....	.....
Amory, William	1850-1871	.....	.....	.....
Amory, William (Jr.).....	1872-1882	.....	1879-1881	.....
Amory, William	1913-1919	.....	.....	.....
Anthony, Edward L.....	.....	.....	.....	1888-1913
Atkinson, Edward	1865-1905	1886-1894	{ 1861-1866 1876-1876	.....
Ayer, Nathaniel F.....	1934-1947	1917-1941	1929-1929	.....
Bacon, John E.....	.....	.....	{ 1860-1866 1868-1872	.....
Bacon, Peter C.....	.....	.....	1855-1855	.....
Bailey, Harry L.....	1938-1946	1924-1941	.....	.....
Baker, Joseph A. ....	.....	.....	1896-1914	.....
Ballard, Joshua .....	.....	.....	1880-1880	.....
Barker, William T. ....	.....	1896-1901	.....	.....
Barnard, Lewis .....	.....	.....	1867-1878	.....
Bent, William H.	1886-1921	.....	.....	.....
Bigelow, Charles B. ....	.....	.....	1882-1900	.....
Bigelow, Henry N.....	.....	.....	1856-1881	.....
Billings, George W.....	.....	.....	.....	1870-1871
†Black, S. Bruce	1934-	1938-1941	.....	.....

DIRECTORS OF THE FOUR COMPANIES

YEARS OF SERVICE

	<i>Boston</i>	<i>Paper Mill</i>	<i>Worcester</i>	<i>Fall River</i>
Blackburn, George .....	.....	.....	1855-1865	.....
Blackstone, Lorenzo .....	.....	.....	1880-1888	.....
†Bliss, Henry M.	1944-	.....	.....	.....
Borden, Charles N. ....	.....	.....	.....	1908-1937
Borden, Jefferson .....	.....	.....	.....	1870-1887
Borden, Philip D. ....	.....	.....	.....	1870-1896
Borden, Richard B. ....	.....	.....	.....	1871-1906
†Borden, Spencer	1947-	.....	.....	1912-1946
Borden, Thomas J.	1878-1894	.....	1879-1894	1870-1902
Brayton, David A. ....	.....	.....	.....	1870-1881
Brayton, David A. (Jr.)....	.....	.....	.....	1881-1913
Brayton, Thomas E. ....	.....	.....	.....	1888-1931
Brayton, William L. S....	.....	.....	.....	1924-1932
Briggs, Lucius .....	.....	.....	1882-1901	.....
Brooks, George F. ....	.....	.....	1911-1937	.....
Buck, Waldo E. ....	.....	.....	1896-1945	.....
Buckley, Louis H. ....	.....	.....	1915-1924	.....
Bullock, A. H. ....	.....	.....	{ 1855-1855 1860-1865	.....
†Burke, James A.	1947-	.....	.....	1934-1946
Chace, Isaac B. ....	.....	.....	.....	1870-1887
Chace, James H. ....	.....	.....	1880-1912	.....
Chace, Jonathan	1879-1917	.....	.....	.....
Chace, Oliver .....	.....	.....	.....	1870-1874
Chace, S. Angier .....	.....	.....	.....	1870-1878
Chase, Edmund .....	.....	.....	.....	1882-1883
Chase, Frederick T. ....	.....	.....	1890-1898	.....
Chase, Simeon B.	1895-1935	.....	.....	1886-1935
Cheney, Frank (Jr.)	1918-1939	1938-1939	.....	.....
Clapp, Channing	1882-1884	.....	.....	.....
Clough, George H.	1947-1948	.....	.....	.....
Codman, Edward W.	1875-1877	.....	.....	.....
Coe, Henry F.	1878-1885	.....	1879-1892	.....
Coe, John A.	1941-1946	.....	.....	.....
Colby, Alfred E.	1928-1941	1938-1941	.....	.....
Coleman, Cornelius A. ....	.....	.....	1893-1896	.....
Crocker, Alvah .....	.....	1900-1907	.....	.....
Crocker, Bartow .....	.....	1928-1937	.....	.....
Crocker, Charles E. ....	.....	1886-1888	.....	.....
Dale, Ebenezer	1871-1871	.....	.....	.....
†Dalton, Marshall B.	1934-	1934-1941	1935-1946	1935-1946
Davol, Bradford D. ....	.....	.....	.....	1879-1923
Davol, Stephen .....	.....	.....	.....	1870-1888

DIRECTORS OF THE FOUR COMPANIES YEARS OF SERVICE

	<i>Boston</i>	<i>Paper Mill</i>	<i>Worcester</i>	<i>Fall River</i>
Day, William O. ....	.....	.....	1925-1927	.....
Dean, Charles A. ....	.....	1886-1888	.....	.....
Denny, Henry A. ....	.....	.....	1855-1860	.....
Denny, R. S. ....	.....	.....	1855-1858	.....
Dewey, F. H. ....	.....	.....	1860-1865	.....
Devoll, William O. ....	.....	.....	.....	1903-1922
DeWitt, Alexander ....	.....	.....	1855-1855	.....
Dexter, George	1877-1910	.....	.....	.....
Draper, William F.	1890-1897	.....	1889-1889	.....
†Dumaine, Frederic C.	1916-	1938-1941	.....	.....
Durfee, George B. ....	.....	.....	.....	1876-1881
Durfee, Nathan	1947-1948	.....	.....	1914-1946
Durfee, Walter C. ....	.....	.....	.....	1880-1901
Dwight, Edmund	1864-1871	.....	.....	.....
Dwight, William	1850-1870	.....	.....	.....
Dyer, D. Hartwell ....	.....	.....	.....	{ 1870-1870 1872-1874
Eaton, E. B. ....	.....	1889-1902	.....	.....
Eddy, James C. ....	.....	.....	.....	1888-1896
Eddy, Thomas F. ....	.....	.....	.....	1875-1886
Edmunds, J. Wiley ....	.....	.....	1855-1855	.....
Edwards, Jacob ....	.....	.....	1882-1888	.....
Estabrook, James ....	.....	.....	1855-1855	.....
Farnsworth, Ezra	1872-1890	.....	.....	.....
Farwell, John W. ....	.....	.....	1895-1928	.....
Foster, Dwight ....	.....	.....	1855-1856	.....
Fox, William B. (Jr.)....	.....	.....	1855-1861	.....
Gardner, Henry J. ....	.....	.....	1866-1870	.....
Gardner, John ....	.....	.....	1861-1873	.....
Gilbert, Edward A. ....	.....	1902-1911	.....	.....
Gleason, B. W. ....	.....	.....	1871-1879	.....
†Goddard, R. H. Ives	1918-	1938-1941	.....	.....
Goodale, Alfred M.	1898-1902	.....	.....	.....
Gray, Joseph P.	1906-1929	.....	.....	.....
Gray, William	1853-1853	.....	1881-1881	.....
Greene, Edwin Farnham ..	1907-1928	.....	.....	.....
Greenleaf, Orick H. ....	.....	1888-1896	1885-1896	.....
†Hall, H. Dwight	1944-	.....	.....	.....
Hapgood, Asa G. ....	.....	1886-1889	.....	.....
Harris, William H. ....	.....	.....	1855-1855	.....
Hastings, Solon S. ....	.....	.....	1855-1855	.....
Hathaway, George T. ....	.....	.....	.....	1875-1878
†Hawkins, Bertram S.	1942-	.....	.....	.....

DIRECTORS OF THE FOUR COMPANIES

YEARS OF SERVICE

	<i>Boston</i>	<i>Paper Mill</i>	<i>Worcester</i>	<i>Fall River</i>
†Heald, Roger N.	1947-	.....	1938-1946	.....
Healy, Joseph .....	.....	.....	.....	1888-1901
Heath, Walter C.	1938-1946	1922-1941	.....	.....
†Higgins, Milton P.	1947-	.....	1941-1946	.....
Hills, George H. ....	.....	.....	.....	1901-1917
Hobson, Arthur L. ....	.....	1920-1921	.....	.....
Hodges, George (Jr.)....	.....	.....	1860-1865	.....
Hodges, Samuel L. ....	.....	.....	1855-1865	.....
Holbrook, G. B. ....	.....	1902-1918	.....	.....
Hollingsworth, Amor L....	.....	1886-1905	.....	.....
Hollister, Clifford F.	1934-1941	1938-1941	.....	.....
Jennings, William H. ....	.....	.....	.....	1870-1885
Jennings, William H. ....	.....	.....	.....	1936-1944
Jourdan, William H. ....	.....	.....	1867-1878	.....
Joy, Charles H.	1876-1885	.....	.....	.....
Kilburn, Elijah C. ....	.....	.....	.....	1874-1884
Knowles, Joseph F. ....	.....	.....	.....	1898-1909
Knowlton, J. S. C. ....	.....	.....	1855-1855	.....
Kunhardt, L. Henry	1929-1933	1931-1933	.....	1927-1933
Lane, David W.	1938-1940	1908-1940	.....	.....
Lapham, Frederick A. ....	.....	.....	1894-1896	.....
Lapham, Morey A. ....	.....	.....	1872-1893	.....
Lockwood, H. DeForest...	1919-1943	1912-1941	.....	.....
Lovering, Charles L. ....	.....	.....	.....	1870-1875
Lovering, Henry M. ....	.....	1895-1916	.....	.....
Lowe, Arthur H. ....	.....	1895-1932	.....	.....
Lowell, Augustus	1885-1890	.....	.....	.....
Lyman, Arthur T.	1887-1915	.....	.....	.....
†Lyman, Ronald T.	1915-	1938-1941	.....	.....
†Madden, M. Lester	1938-	1932-1941	.....	.....
Mansfield, Henry S. ....	.....	.....	1866-1878	.....
Manton, Edward E.	1865-1878	.....	1861-1878	.....
†Mason, Albert G.	1947-	.....	1912-1946	.....
Mason, Herbert W. ....	.....	1910-1924	.....	.....
Mason, John C. ....	.....	.....	1855-1855	.....
Mason, Mortimer B. ....	.....	1889-1909	.....	.....
McDuffie, Frederic C.	1910-1942	1938-1941	.....	.....
Merrifield, William T. ....	.....	.....	1855-1855	.....
Metcalf, Edwin F.	1940-1949	.....	.....	.....
†Milliken, Joseph K.	1943-	1941-1941	.....	1921-1946
Mills, Charles H.	1850-1857	.....	.....	.....
Moen, Philip W. ....	.....	.....	1893-1901	.....
Morgan, Paul B. ....	.....	.....	1923-1946	.....

DIRECTORS OF THE FOUR COMPANIES

YEARS OF SERVICE

	<i>Boston</i>	<i>Paper Mill</i>	<i>Worcester</i>	<i>Fall River</i>
†Morgan, Philip M.	1947-	.....	.....	.....
Morss, Everett	1932-1933	.....	.....	.....
†Morss, Everett	1938-	1936-1941	.....	.....
Mudge, E. R.	1871-1875	.....	.....	.....
Newton, James N. ....	.....	1886-1889	.....	.....
Nichols, Howard S. O. ....	.....	1919-1929	.....	.....
Osborn, James E. ....	.....	.....	1916-1940	1897-1940
Paine, Walter (3rd) ....	.....	.....	.....	1870-1879
Park, Daniel	1866-1874	.....	.....	.....
†Parsons, Brackett	1950-	.....	.....	.....
Parsons, Theophilus	1897-1916	.....	.....	.....
†Phillips, James Duncan ...	1938-	1930-1941	.....	.....
Pierce, Andrew G.	1890-1902	.....	.....	1870-1896
Pierce, Andrew G. (Jr.)....	.....	.....	.....	1898-1940
Pierce, Edward T.	1903-1934	.....	.....	.....
Pratt, Waldo E. ....	.....	1906-1931	.....	.....
†Quigley, Arthur H.	1946-	.....	.....	.....
Read, James	1850-1870	.....	1861-1870	.....
†Read, William T.	1947-	.....	.....	1939-1946
†Reed, Alden	1943-	1941-1941	1930-1946	.....
Rice, George M. ....	.....	.....	1855-1894	.....
Richardson, F. L.	1872-1897	.....	.....	.....
†Richmond, Carleton R. ...	1947-	.....	.....	.....
Rogers, Charles B.	1908-1918	.....	.....	.....
Rogers, Edward C. ....	.....	1886-1899	.....	.....
Russell, W. D. ....	.....	1897-1901	.....	.....
Saltonstall, Henry	1885-1895	.....	.....	.....
Saunders, Esek .....	.....	.....	1855-1893	.....
Scott, Albert L. ....	.....	1910-1931	.....	.....
†Scott, Russell G.	1947-	.....	.....	1942-1946
Shove, Charles O. ....	.....	.....	.....	1870-1875
Shove, Charles M. ....	.....	.....	.....	1884-1925
Silsbee, Arthur B.	1902-1908	.....	.....	.....
Silsbee, George S.	1895-1907	.....	.....	.....
Skinner, Francis	1854-1865	.....	.....	.....
Smith, Charles W. ....	.....	.....	1866-1866	.....
Smyth, Ellison A.	1938-1942	1902-1941	.....	.....
Snelling, R. Paul .....	.....	1895-1935	.....	.....
Spofford, George E.	1938-1940	1930-1940	.....	.....
Stanton, James E. (Jr.)....	.....	.....	.....	1923-1935
Stanton, Seabury .....	.....	.....	1941-1942	1936-1946
Stevens, Dexter	1935-1936	.....	.....	.....
Stevens, Nathaniel .....	.....	.....	1901-1908	.....

DIRECTORS OF THE FOUR COMPANIES		YEARS OF SERVICE			
		<i>Boston</i>	<i>Paper Mill</i>	<i>Worcester</i>	<i>Fall River</i>
Stockton, Howard	.....	{ 1878-1887 1890-1932	.....	1879-1879	.....
†Stone, Malcolm B.	.....	1938-	1935-1941	.....	.....
Storrow, Charles S.	.....	1850-1852	.....	.....	.....
Story, Franklin H.	.....	1858-1866	.....	.....	.....
Sweetser, John A.	.....	1934-1942	1938-1941	.....	.....
†Swift, E. Kent	.....	1921-	1938-1941	.....	.....
Swift, Willard E.	.....	1947-1947	.....	1928-1946	.....
Tainter, Daniel	.....	.....	.....	1855-1860	.....
Terry, H. Nelson G.	.....	.....	.....	.....	1941-1946
Thayer, Edward D.	.....	.....	.....	1867-1867	.....
Toppan, Roland W.	.....	.....	1889-1927	.....	.....
Walcott, Charles	.....	.....	1912-1936	.....	.....
Waring, Charles S.	.....	.....	.....	.....	1909-1927
Warren, Samuel D.	.....	.....	1909-1910	.....	.....
Washburn, Ichabod	.....	.....	.....	1855-1855	.....
Weld, Francis M.	.....	1867-1885	.....	.....	.....
Wells, George W.	.....	.....	.....	1902-1912	.....
Weston, Byron	.....	.....	{ 1886-1888 1890-1896	.....	.....
Wheeler, William A.	.....	.....	.....	1855-1855	.....
Wheelwright, George W...	.....	.....	1886-1924	.....	.....
Wheelwright, George W...	.....	.....	1924-1929	.....	.....
White, Alonzo	.....	.....	.....	1855-1860	.....
Whitin, Charles E.	.....	1879-1890	.....	1871-1890	.....
Whitin, Edward	.....	.....	.....	1889-1913	.....
Whitin, Henry T.	.....	.....	.....	1891-1931	.....
Whitin, James E.	.....	.....	.....	1913-1941	.....
Whitin, James F.	.....	.....	.....	1862-1875	.....
Whitin, John C.	.....	.....	.....	1859-1859	.....
Whitin, Paul	.....	.....	.....	1860-1884	.....
†Whitin, Paul	.....	1947-	.....	1932-1946	.....
Whiting, William H. H...	.....	.....	1894-1912	1894-1912	.....
Whiting, William	.....	.....	.....	1897-1911	.....
†Whiting, William	.....	1947-	.....	1920-1946	.....
Whiting, William B.	.....	1879-1879	1886-1894	1879-1894	.....
Whiting, William F.	.....	.....	.....	1911-1919	.....
Whitman, William	.....	.....	.....	1898-1900	.....
Whittall, Matthew J.	.....	.....	.....	1895-1922	.....
Whittall, Matthew P.	.....	.....	.....	1923-1933	.....
Williams, Edward H.	.....	.....	1940-1941	.....	.....
†Williamson, George E.	...	1950-	.....	.....	.....
†Wise, James DeCamp	....	1945-	.....	.....	.....

THE STRONG BAND OF BROTHERS

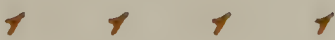
The combined statistics of the Boston Manufacturers Mutual and its brother-companies of the Factory Mutual system, are as follows:

Growth in a Turbulent Decade 1940-1949 inclusive

	1940	1949
Net insurance in force	\$10,500,000,000	\$33,299,000,000
Net assets at market value . .	63,200,000	187,400,000
Net premium deposits	55,600,000	175,300,000
Surplus in excess of legal re- quirements	40,700,000	95,200,000

Loss Prevention Know-How

	1940	1949
Net loss ratio, in cents per \$100 insured . . .	3.10¢	2.24¢



The Companies composing the Factory Mutual brotherhood, with the year of incorporation, follow:

Boston Manufacturers Mutual Fire Insurance Company, Boston	1850
Arkwright Mutual Fire Insurance Company, Boston	1860
Cotton & Woolen Manufacturers Mutual Insurance Company, Boston..	1875
Manufacturers Mutual Fire Insurance Company, Providence.....	1835
Firemen's Mutual Insurance Company, Providence.....	1854
Blackstone Mutual Fire Insurance Company, Providence.....	1868
What Cheer Mutual Fire Insurance Company, Providence.....	1873
Philadelphia Manufacturers Mutual Fire Insurance Company, Philadelphia	1880
Protection Mutual Fire Insurance Company, Chicago.....	1887

Through association these brother-companies provide more comprehensive loss prevention data, have greater underwriting capacity, and achieve greater efficiency and economy in insurance coverage, in inspections, general fire prevention engineering, research, plan making, adjustments and appraisals.

